

02716.0005.NPUS01.ST25.txt SEQUENCE LISTING

<110> JENSEN, Rasmus B. KELEMEN, Bradley

<120> PROTEORHODOPSIN MUTANTS WITH IMPROVED OPTICAL CHARACTERISTICS

<130> 02716.0005.NPUS01

<150> 60/429,518 <151> 2002-11-26

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Phe Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60 ,

Ala Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Asp Thr Gly Asp Thr Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Met Val Glu Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Cys Thr Ser Val Ala Ala Ser Leu Phe Lys Lys 115 120 125

Leu Leu Ala Gly Ser Leu Val Met Leu Gly Ala Gly Phe Ala Gly Glu 130 135 140

Ala Gly Leu Ala Pro Val Leu Pro Ala Phe Ile Ile Gly Met Ala Gly 145 150 155 160 02716.0005.NPUS01.ST25.txt

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Val Ser Thr Ala Ser Pro Ala Val Asn Ser Ala Tyr Asn Ala Met Met 180 185 190

Met Ile Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala 195 200 205

Gly Tyr Leu Met Gly Gly Glu Gly Val Tyr Ala Ser Asn Leu Asn Leu 210 215 220

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Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Met Arg 70 75 80

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Ile Ile Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr Gly Tyr 195 200 205

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Trp Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ala Ala 165 170 175

Cys Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met 180 185 190

Tyr Ile Ile Ile Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr 195 200 205

Gly Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile 210 215 220

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Val Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe 35 40 45

Phe Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Page 5 Thr Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Ala Thr Asn Val Ala Ala Gly Leu Phe Lys Lys 115 . 120 125

Leu Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu 130 135 140

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Trp Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ala Ala 165 170 175

Cys Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met 180 185 190

Tyr Ile Ile Ile Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr 195 200 205

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Met Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg 85 90 95

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Trp Val Tyr Met Ile Tyr Glu Leu Tyr Ala Gly Glu Gly Lys Ser Ala 165 170 175

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Ala Ile Ile Val Phe Gly Trp Ala Ile Tyr Pro Ile Gly Tyr Phe Thr 195 200 205

Gly Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile 210 215 220

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Phe Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60

Thr Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Ala Thr Asn Val Ala Ala Gly Leu Phe Lys Lys

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Cys Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met
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Tyr Ile Ile Ile Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr
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Phe Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60													
Thr Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr 65 70 75 80													
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Leu Leu Ala Gly Ser Leu Val Met Leu Gly Ala Gly Phe Ala Gly Glu 130 135 140													
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Lys Ile Ile Val Ile Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala Page 10													

Gly Tyr Leu Met Ser Gly Asp Gly Val Tyr Ala Ser Asn Leu Asn Leu 210 220

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Met Arg Gly Val Trp Ile Asp Thr Gly Asp Thr Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Val Glu Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Cys Thr Ser Val Ala Ala Ser Leu Phe Lys Lys 115 120 125

Leu Leu Ala Gly Ser Leu Val Met Leu Gly Ala Gly Phe Ala Gly Glu 130 135 140

Ala Gly Leu Ala Pro Val Leu Pro Ala Phe Ile Ile Gly Met Ala Gly 145 150 155 160

Trp Leu Tyr Met Ile Tyr Glu Leu Tyr Met Gly Glu Gly Lys Ala Ala 165 170 175

Val Ser Thr Ala Ser Pro Ala Val Asn Ser Ala Tyr Asn Ala Met Met 180 185 190

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Phe Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60

Thr Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Asp Thr Gly Asp Thr Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Met Val Glu Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Cys Thr Asn Val Ala Ala Ser Leu Phe Lys Lys 115 120 125 Page 13

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Ala Gly Leu Ala Pro Val Trp Pro Ala Phe Ile Ile Gly Met Ala Gly 145 150 155 160	
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Val Ser Thr Ala Ser Pro Ala Val Asn Ser Ala Tyr Asn Ala Met Met 180 185 190	
Val Ile Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala 195 200 205	
Gly Tyr Leu Met Gly Gly Glu Gly Val Tyr Ala Ser Asn Leu Asn Leu 210 215 220	
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Val Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe 35 40 45

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Trp Val Tyr Met Ile Tyr Glu Leu Tyr Ala Gly Glu Gly Lys Ser Ala 165 170 175

Cys Asn Thr Ala Ser Pro Ser Val Gln Ser Ala Tyr Asn Thr Met Met 180 185 190

Ala Ile Ile Val Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr 195 200 205

02716.0005.NPUS01.ST25.txt Gly Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile 210 215 220

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Val Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe

Phe Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu
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Thr Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr 100

Leu Ile Leu Ala Ala Ala Thr Asn Val Ala Ala Gly Leu Phe Lys Lys

Leu Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu 130 135 140

Ala Gly Ile Met Asn Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala

Trp Val Tyr Met Ile Tyr Glu Leu Tyr Ala Gly Glu Gly Lys Ser Ala 165 170 175

Cys Asn Thr Ala Ser Pro Ser Val Gln Ser Ala Tyr Asn Thr Met Met Ala Ile Ile Val Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr 195 200 205 Gly Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile 210 215 220 Tyr Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile 225 230 235 240 Trp Asn Val Ala Val Lys Glu Ser Ser Asn Ala <210> 19 753 DNA Marine eubacteria <400> accatgggta aattattact gatattaggt agtgttattg cacttcctac atttqctqca 60 ggtggtggtg accttgatgc tagtgattac actggtgttt ctttttggtt agttactgct 120 gctttattag catctactgt atttttcttt gttgaaagag atagagtttc tgcaaaatgg 180 aaaacatcat taactgtatc tggtcttgtt actggtattg ctttctggca ttacatgtac 240 atgagagggg tatggattga aactggtgat tcgccaactg tatttagata cattgattgg 300 ttactaacag ttcctctatt aatatgtgaa ttctacttaa ttcttgctgc tgctactaat 360 gttgctgctg gcctgtttaa gaaattattg gttggttctc ttgttatgct tgtgtttggt 420 tacatgggtg aagcaggaat tatgaacgct tggggtgcat tcgttattgg gtgtttagct 480 tgggtataca tgatttatga gctttggctt ggagaaggaa aagctgcgtg taatacagca 540 agtcctgctg ttcagtcagc ttacaacaca atgatgatga tcatcatctt tggttgggca 600 atttatcctg taggttattt cacaggttac ctaatgggtg acggtggatc agcacttaac 660 ttaaacctta tctataacct tgctgacttt gttaacaaga ttctatttgg tttaattata 720 tggaatgttg ctgttaaaga atcttctaat gct 753 <210> 20 753 Marine eubacteria <400> accatgggta aattattact gatattaggt agtgttattg cacttcctac atttgctgca 60 ggtggtggtg accttgatgc tagtgattac actggtgttt ctttttggtt agttactgct 120

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<213> Marine eubacteria

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Val Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe 35 40 45

Phe Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60

Thr Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Ala Thr Asn Val Ala Ala Gly Leu Phe Lys Lys 115 120 125

Leu Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Page 18 Ala Gly Ile Met Asn Ala Trp Gly Ala Phe Val Ile Gly Cyś Leu Ala 145 150 155 160

Trp Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ala Ala 165 170 175

Cys Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met 180 185 190

Tyr Ile Ile Ile Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr 195 200 205

Gly Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile 210 215 220

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Trp Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

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<213> Marine eubacteria

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20 25 30

Val Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe 35 40 45

Phe Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60

Thr Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glú Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys 115 120 125

Leu Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu 130 135 140

Ala Gln Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala 145 150 155 160

Trp Val Tyr Met Ile Tyr Glu Leu Tyr Ala Gly Glu Gly Lys Ser Ala 165 170 175

Cys Asn Thr Ala Ser Pro Ser Val Gln Ser Ala Tyr Asn Thr Met Met 180 185 190

Ala Ile Ile Val Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr 195 200 205

Gly Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile 210 220

Tyr Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Leu Gly Leu Ile Ile 225 230 235 240

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tacatgggtg	aagcacaaat	tatggctgca	tggcctgcat	tcattattgg	gtgtttagct	480
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agtccttcgg	ttcaatcagc	ttacaacaca	atgatggcta	tcatagtctt	cggttgggca	600
atttatcctg	taggttattt	cacaggttac	ctaatgggtg	acggtgggtc	agctcttaac	660
ttaaacctta	tttataacct	tgctgacttt	gttaacaaga	ttctacttgg	tttaattata	720
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Val Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe 35 40 45

Phe Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60 Page 21

²⁵ 249

<212> **PRT**

<213> Marine eubacteria

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Tyr	Ile	Asp	Trp 100	Leu	Leu	Thr	Val	Pro 105	Leu	Leu	Ile	Cys	Glu 110	Phe	туг	
Leu	Ile	Leu 115	Ala	Ala	Ala	Ala	Asn 120	٧a٦	Ala	Gly	Ser	Leu 125	Phe	Lys	Lys	
Leu	Leu 130	val	Gly	Ser	Leu	Val 135	Met	Leu	val	Phe	Gly 140	Tyr	Met	Gly	Glu	
Ala 145	Gly	Ile	Met	Ala	Ala 150	Trp	Pro	Ala	Phe	Ile 155	Ile	Gly	Cys	Leu	Ala 160	•
Trp	val	Tyr	Met	Ile 165	Tyr	Glu	Leu	Trp	Ala 170	Gly	Glu	Gly	Lyś	Ser 175	Ala	
Cys	Asn	Thr	Ala 180	Ser	Pro	Ala	val	Gln 185	Ser	Ala	Tyr	Asn	Thr 190	Met	Met	
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Gly	Tyr 210	Leu	Met	Gly	Asp	Gly 215	Gly	Ser	Ala	Leu	Asn 220	Leu	Asn	Leu	Ile	
Tyr 225	Asn	Leu	Ala	Asp	Phe 230	val	Asn	Lys	Ile	Leu 235	Phe	Gly	Leu	Ile	Ile 240	
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													•		ictgct laatgg	120 180
								•								
uuue		.a. l	.aact	.g.al	.c cy	gict	. cy c t		.gg.ca 'age		CILL	ccyg	ica (Laca	itgtac	240

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Marine eubacteria

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Val Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe 35 40 45

Phe Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60 .

Thr Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr 100 105 110

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Leu Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu

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Trp Val Tyr Met Ile Tyr Glu Leu Tyr Ala Gly Glu Gly Lys Ser Ala 165 170 175

Cys Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met 180 185 190

Tyr Ile Ile Val Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr 195 200 205

Gly Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile 210 215 220

Tyr Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile 225 230 235 240

Trp Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

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<213> Marine eubacteria

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Thr Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly 20 25 30

Val Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe 35 40 45

Phe Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60

Thr Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Ala Thr Asn Val Ala Ala Gly Leu Phe Lys Lys 115 120 125

Leu Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu 130 135 140

Ala Gly Ile Met Asn Ala Trp Gly Ala Phe Val Ile Gly Cys Leu Ala 145 150 155 160

Trp Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ala Ala 165 170 175

Cys Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met 180 185 190

Tyr Ile Ile Ile Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr 195 200 205

Gly Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile 210 215 220

Tyr Asn Leu Ala Asp Phe Val Asn Lys Asn Leu Phe Gly Leu Ile Ile 225 230 235 240 Page 25

Trp Asn Val Ala Val Lys Glu Ser Ser

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<213> Marine eubacteria

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Val Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe 35 40 45

Phe Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60

Thr Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Page 26

Met Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg 85 90 95

70

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys 115 120 125

Leu Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu 130 135 140

Ala Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala 145 150 155 160

Trp Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala 165 170 175

Cys Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met 180 185 190

Tyr Ile Ile Val Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr 195 200 205

Gly Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile 210 215 220

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Trp Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

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Val Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe 35 40 45

Phe Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60

Thr Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys 115 120 125

Leu Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu 130 135 140

Ala Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala 145 150 155 160

Trp Val Tyr Met Ile Tyr Glu Leu Tyr Ala Gly Glu Gly Lys Ser Ala 165 170 , 175

Cys Asn Thr Ala Ser Pro Ser Val Gln Ser Ala Tyr Asn Thr Met Met 180 185 190

Ala Ile Ile Val Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr 195 200 205

Gly Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile 210 215 220

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Trp Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

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Phe Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60

Thr Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys 125

Leu Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu 130 135 140

Ala Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala 145 150 155 160

Trp Val Tyr Met Ile Tyr Glu Leu Tyr Ala Gly Glu Gly Lys Ser Ala 165 170 175

Cys Asn Thr Ala Ser Pro Ser Val Gln Ser Ala Tyr Asn Thr Met Met 180 185 190

Ala Ile Ile Val Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr 195 200 205

Gly Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile 210 215 220

Tyr Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile 225 230 235 240

Trp Asn Ala Ala Val Lys Glu Ser Ser Asn Ala Page 30

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<212> PRT

<213> Marine eubacteria

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Val Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe 35 40 45

Phe Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60

Thr Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr 65 70 75 80

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Tyr	Ile	Asp	Trp 100	Leu	Leu	Thr	val	Pro 105	Leu	Leu	Ile	Cys	Glu 110	Phe	Tyr	•
Leu	Ile	Leu 115	Ala	Ala	Ala	Thr	Asn 120	val	Аlа	Gly	Ser	Leu 125	Phe	Lys	Lys	
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Ala 145	Gly	Ile	Met	Ala	Ala 150	Trp	Pro	Ala	Phe	Ile 155	Ile	Gly	Cys	Leu	Ala 160	
Trp	val	туr	Met	11e 165	Tyr	Glu	Leu	Trp	Ala 170	Gly	Glu	Gly	Lys	Ser 175	Ala	
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Met Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys 115 120 125

Leu Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu 130 135 140

Ala Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Val Gly Cys Leu Ala 145 150 155 160

Trp Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala 165 170 175 Page 33

Cys Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met 180 185 190

Tyr Ile Ile Ile Val Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr 195 200 205

Gly Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile 210 215 220

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Trp Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

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<210> 41 <211> 252

<211> 232 <212> PRT

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Phe Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60

Thr Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Asp Thr Gly Asp Thr Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Met Val Glu Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Cys Thr Ser Val Ala Ala Ser Leu Phe Lys Lys 115 120 125

Leu Leu Ala Gly Ser Leu Val Met Leu Gly Ala Gly Phe Ala Gly Glu 130 140

Ala Gly Leu Ala Pro Val Leu Pro Ala Phe Ile Leu Gly Met Ala Gly 145 150 155 160

Trp Leu Tyr Met Ile Tyr Glu Leu His Met Gly Glu Gly Lys Ala Ala 165 170 175

Val Ser Thr Ala Ser Pro Ala Val Asn Ser Ala Tyr Asn Ala Met Met 180 185 190

Lys Ile Ile Val Ile Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala 195 200 205

Gly Tyr Leu Met Ser Gly Asp Gly Val Tyr Ala Ser Asn Leú Asn Leu 210 215 220

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Phe Phe Val Glu Arg Asp Gln Val Ser Ala Glu Trp Lys Thr Ser Leu 50 60	
Thr Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr 65 75 80	
Met Ard Gly Val Trn Tle Asn Thr Gly Asn Thr Bro Thr Val Bho Ard	

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Met Val Glu Phe Tyr 100 105 110	
Leu Ile Leu Ala Ala Cys Thr Ser Val Ala Ala Ser Leu Phe Lys Lys 115 120 125	
Leu Leu Ala Gly Ser Leu Val Met Leu Gly Ala Gly Phe Ala Gly Glu 130 135 140	
Ala Gly Leu Ala Pro Val Leu Pro Ala Phe Ile Ile Gly Met Ala Gly 145 150 155 160	
Trp Leu Tyr Met Ile Tyr Glu Leu Tyr Met Gly Glu Gly Lys Ala Ala 165 170 175	
Val Ser Thr Ala Ser Pro Ala Val Asn Ser Ala Tyr Asn Ala Met Met 180 185 190	
Met Ile Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala 195 200 205	
Gly Tyr Leu Met Gly Gly Glu Gly Val Tyr Ala Ser Asn Leu Asn Leu 210 215 220	
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Marine eubacteria

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Phe Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60

Thr Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr 65 75 80

Met Arg Gly Val Trp Ile Asp Thr Gly Asp Thr Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Met Val Glu Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Cys Thr Asn Val Ala Ala Ser Leu Phe Lys Lys

Leu Leu Ala Gly Ser Leu Val Met Leu Gly Ala Gly Phe Ala Gly Glu 130 135 140

Ala Gly Leu Ala Pro Val Trp Pro Ala Phe Ile Ile Gly Met Ala Gly 145 150 155 160

Trp Leu Tyr Met Ile Tyr Glu Leu Tyr Met Gly Glu Gly Lys Ala Ala 165 170 175

Val Ser Thr Ala Ser Pro Ala Val Asn Ser Ala Tyr Asn Ala Met Met Page 38

Met Ile Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala 195 200 205

Gly Tyr Leu Met Gly Gly Glu Gly Val Tyr Ala Ser Asn Leu Asn Leu 210 220

Ile Tyr Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile 225 230 235 240

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Thr Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Asp Thr Gly Asp Thr Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Met Val Glu Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Cys Thr Ser Val Ala Ala Ser Leu Phe Lys Lys 115 120 125

Leu Leu Ala Gly Ser Leu Val Met Leu Gly Ala Gly Ser Ala Gly Glu 130 135 140

Ala Gly Leu Ala Pro Val Leu Pro Ala Phe Ile Ile Gly Met Ala Gly 145 150 155 160

Trp Leu Tyr Met Ile Tyr Glu Leu Tyr Met Gly Glu Gly Lys Ala Ala 165 170 . 175

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Val Ser Phe Trp Leu Val Thr Ala Gly Met Leu Ala Ala Thr Val Phe 35 40 45

Phe Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60

Thr Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr 65 75 80

Met Arg Gly Val Trp Ile Asp Thr Gly Asp Thr Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Met Val Glu Phe Tyr 100 105 110
Page 41

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tttgcag	ggcg a	aagct	ggat	t ag	ctcc	tgta	tgg	cctg	ctt	tcat	tatt	gg t	atgg	gctgga	480
tggttat	aca 1	tgatt	tatg	ja go	tata	tatg	ggt	gaag	ıgta	aggo	tgct	gt ′a	agta	ıctgca	540
agtcctg	ctg t	ttaac	tctg	jc at	acaa	cgca		atgg age		ttat	tgtt	gt t	ggat	gggca	600

660720

756

atti	tatc	ctg	ctgga	atat	gc t	gctg	gtta	cta	aatg	ggtg	gcga	aagg [.]	tgt a	atac	gcttca
aaco	ctaa	acc	ttata	atata	aa c	cttg	ctga	tt	tgtt	aaca	aga	ttct	att [']	tggti	ttgatc
atti	tgga	atg '	ttgc	tgtta	aa a	gaat	cttc	t aa	tgct						
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<400)> !	51	•										,		
Thr 1	Met	Gly	Lys	Leu 5	Leu	Leu	Ile	Leu	Gly 10	Ser	Ala	Ile	Ala	Leu 15	Pro
Ser	Phe	Аlа	Ala 20	Ala	Gly	Gly	Asp	Leu 25	Asp	Ile	Ser	Asp	Thr 30	val	Gly
Val	Ser	Phe 35	Тгр	Leu	val	Thr	Ala 40	Gly	Met	Leu	Ala	Ala 45	Thr	val	Phe
Phe	Phe 50	٧a٦	Glu	Arg	Asp	Gln 55	٧a٦	Ser	Ala	Lys	Trp 60	Lys	Thr	Ser	Leu
Thr 65	val	Ser	Gly	Leu	11e 70	Thr	Gly	Ile	Ala _.	Phe 75	Trp	His	Tyr	Leu	Туг 80
Met	Arg	Gly	∨al	Trp 85	Ile	Asp	Thr	Gly	Asp 90	Thr	Pro	Thr	val	Phe 95	Arg
Tyr	Ile	Asp	Trp 100	Leu	Leu	Thr	val	Pro 105	Leu	Gln	Met	val	Glu 110	Phe	Tyr
Leu	Ile	Leu 115	Ala	Ala	Cys	Thr	Ser 120	Val	Ala	Ala	Ser	Leu 125	Phe	Lys	Lys
Leu	Leu 130	Ala	Gly	Ser	Leu	val 135	Met	Leu	Gly	Αla	Gly 140	Phe	Αlά	Gly	Glu
Ala 145	Gly	Leu	Ala	Pro	Val 150	Leu	Pro	Ala	Phe	Ile 155	Ile	Gly	Met	Ala	Gly 160
Trp	Leu	Tyr	Met	11e 165	Tyr	Glu	Leu	Tyr	Меt 170	Gly	Glu	Gly	Lys ,	А]а 175	

Val Ser Thr Ala Ser Pro Ala Val Asn Ser Ala Tyr Asn Ala Met Met 180 185 190 02716.0005.NPUS01.ST25.txt Met Ile Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyŕ Ala Ala 195 200 205

Gly Tyr Leu Met Gly Gly Glu Gly Val Tyr Ala Ser Asn Leu Asn Leu 210 215 220

Ile Tyr Asn Leu Ala Asp Leu Val Asn Lys Ile Leu Phe Gly Leu Ile 225 230 235 240

Ile Trp Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

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<213> Marine eubacteria

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<210> 53 <211> 252 <212> PRT <213> Marine eubacteria

vers mai the cabacter to

<400> 53

Thr Met Gly Lys Leu Leu Leu Ile Leu Gly Ser Ala Ile Ala Leu Pro 10 15

Ser Phe Ala Ala Ala Gly Gly Asp Leu Asp Ile Ser Asp Thr Val Gly 20 25 30

Val Ser Phe Trp Leu Val Thr Ala Gly Met Leu Ala Ala Thr Val Phe 35 40 45

Phe Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60

Thr Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Asp Thr Gly Asp Thr Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Val Glu Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Cys Thr Ser Val Ala Ala Ser Leu Phe Lys Lys 115 120 125

Leu Leu Ala Gly Ser Leu Val Met Leu Gly Ala Gly Phe Ala Gly Glu 130 135 140

Ala Gly Leu Ala Pro Val Leu Pro Ala Phe Ile Ile Gly Met Ala Gly 145 150 155 160

Trp Leu Tyr Met Ile Tyr Glu Leu Tyr Met Gly Glu Gly Lys Ala Ala 165 170 175

Val Ser Thr Ala Ser Pro Ala Val Asn Pro Ala Tyr Asn Ala Met Met 180 185 190

Met Ile Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala 195 200 205

Gly Tyr Leu Met Gly Gly Glu Gly Val Tyr Ala Ser Asn Leu Asn Leu 210 220

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Ile Trp Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

<400> 54

<210> 54

<211> 756

<212> DNA

<213> Marine eubacteria

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ggtatgttag	cggcaactgt	gttcttttt	gtagaaagag	accaagtcag	cgctaagtgg	180
aaaacttcac	ttactgtatc	tggtttaatt	actggtatag	ctttttggca	ttatctctat	240
atgagaggtg	tttggataga	cactggtgat	accccaacag	tattcagata	tattgattgg	300
ttattaactg	ttccattaca	agtggttgag	ttctatctaa	ttcttgctgc	ttgtacaagt	360
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tggttataca	tgatttatga	gctatatatg	ggtgaaggca	aggctgctgt	aagtactgca	540
agtcctgctg	ttaaccctgc	atacaacgca	atgatgatga	ttattgttgt	tggatgggca	600
atttatcctg	ctggatatgc	tgctggttac	ctaatgggtg	gcgaaggtgt	atacgcttca	660
aacttaaacc	ttatatataa	ccttgctgac	tttgttaaca	agattctatt	tggtttgatc	720
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<211> 257

<212> PRT

<213> Marine eubacteria

<400> 55

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Ser Phe Ala Ala Gly Gly Asp Leu Asp Ile Ser Asp Thr Val Gly 20 25 30

Val Ser Phe Trp Leu Val Thr Ala Gly Met Leu Ala Ala Thr Val Phe 35 40 45

Phe Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60

Thr Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Asp Thr Gly Asp Thr Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Met Val Glu Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Cys Thr Ser Val Ala Ala Ser Leu Phe Lys Lys Page 46 Leu Leu Ala Gly Ser Leu Val Met Leu Gly Ala Gly Phe Ala Gly Glu 130 135 140

Ala Gly Leu Ala Pro Val Leu Pro Ala Phe Ile Ile Gly Met Ala Gly 145 150 155 160

Trp Leu Tyr Met Ile Tyr Glu Leu His Met Gly Glu Gly Lys Ala Ala 165 170 ' 175

Val Ser Thr Ala Ser Pro Ala Val Asn Ser Ala Tyr Asn Ala Met Met 180 185 190

Lys Ile Ile Val Ile Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala 195 200 205

Gly Tyr Leu Met Ser Gly Asp Gly Val Tyr Ala Ser Asn Leu Asn Leu 210 215 220

Ile Tyr Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile 225 230 235 240

Ile Trp Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

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<211> 756

<213> Marine eubacteria

<400> 56

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756

<210> 57

<211> 252

<212> PRT

<213> Marine eubacteria

<400> 57

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Ser Phe Ala Ala Gly Gly Asp Leu Asp Ile Ser Asp Thr Val Gly 20 25 30

Val Ser Phe Trp Leu Val Thr Ala Gly Met Leu Ala Ala Thr Val Phe 35 40 45

Phe Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60

Thr Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Asp Thr Gly Asp Thr Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Met Val Glu Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Cys Thr Ser Val Ala Ala Ser Leu Phe Lys Lys 115 120 125

Leu Leu Ala Gly Ser Leu Val Met Leu Gly Ala Gly Phe Ala Gly Glu 130 135 140

Ala Gly Leu Ala Pro Val Leu Pro Ala Phe Ile Ile Gly Met Ala Gly 145 150 155 160

Trp Leu Tyr Met Ile Tyr Glu Leu Tyr Met Gly Glu Gly Lys Ala Ala 165 170 175

Val Ser Thr Ala Ser Pro Ala Val Asn Ser Ala Tyr Asn Ala Met Met 180 185 190

Met Ile Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala 195 200 205

Gly Tyr Leu Met Gly Gly Glu Gly Val Tyr Ala Ser Asn Leu Asn Leu 210 215 220

Ile Tyr Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile 225 230 235 240

Ile Trp Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

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58 756 <211>

DNA

Marine eubacteria

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<210> 59

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PRT

Marine eubacteria

<400> 59

Met Gly Lys Leu Leu Leu Ile Leu Gly Ser Val Ile Ala Leu Pro Thr 1 5 10 15

Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val 20 25 30

Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45 Page 49

Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phé Tyr Leu $100 \hspace{1cm} 105 \hspace{1cm} 110$

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala 130 135 140

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp 145 150 155 160

Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys 165 170 175

Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190

Ile Ile Ile Val Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr Gly 195 200 205

Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr 210 215 220

Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile Trp 225 230 235 240

Asn Val Ala Val Lys Lys Ser Ser Asn Ala 245 250

<210>

751

<212> DNA

Marine eubacteria

<400> 60

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60

120

ctattagcgt	ctactgtatt	cttctttgtt	gaaagagata	gagtgtctgc	aaaatggaaa	180
acttcattaa	cagtatctgg	tttagttact	ggtattgctt	tttggcatta	tatgtacatg	240
agaggtgtat	ggatagaaac	tggtgattcg	cctactgtct	ttagatacat	cgactggtta	300
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gctggttcat	tatttaagaa	attgctagtt	ggttctcttg	tgatgcttgt	gtttggttac	420
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gtatatatga	tttatgaact	atgggctggt	gaaggaaaat	ctgcatgcaa	tactgcaagt	540
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<210> 61

<211> 250

<212> PRT

<213> Marine eubacteria

<400> 61

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Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 55 60

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

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Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala
130 135 140

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp 145 150 155 160

Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys 165 170 175

Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190

Ile Ile Ile Val Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr Gly 195 200 205

Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr 210 215 220

Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile Trp 225 230 235 240

Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

62 751 <210>

Marine eubacteria

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<210> 63 <211> 250

<212> PRT

<213> Marine eubacteria

<400> 63

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Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val 20 25 30

Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Ser Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala 130 140

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp 145 150 155 160

Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys 165 170 175

Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190

Ile Ile Ile Ala Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr Gly 195 200 205

Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr 210 215 220 Page 53

Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile Trp 225 230 235 240

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<211> 250 <212> PRT

<213> Marine eubacteria

<400> 65

Met Gly Lys Leu Leu Leu Ile Leu Gly Ser Val Ile Ala Leu Pro Thr 1 5 10 15

Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val

Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr Page 54 Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg Tyr 85 90 '95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala 130 135 140

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp 145 150 155 160

Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys 165 170 175

Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190

Ile Ile Ile Val Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr Gly
195 200 205

Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr 210 215 220

Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile Trp 225 230 235 240

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<210> 66

<211> 751

<212> DNA

<213> Marine eubacteria

<400> 66

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atgggtgaag	caggaataat	ggcagcttgg	cctgcattca	tcattggatg	tttagcatgg	480
gtatatatga	tttatgaact	atgggctggt	gaaggaaaat	ctgcatgcaa	tactgcaagt	540
cctgctgtac	agtcagctta	caacacaatg	atgtatatca	tcatcgttgg	ttgggcaatt	600
tatcctgtag	gttatttcac	aggttaccta	atgggtgacg	gtggatcagc	tcttaatcta	660
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<211> 250

<212> PRT

<213> Marine eubacteria

<400> 67

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Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Ser Ser Pro Thr Val Phé Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala 130 135 140

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp 145 150 155 160

Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys 165 170 175

Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190

Ile Ile Ile Ala Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr Gly 195 200 205

Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Asn Tyr 210 215 220

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<213> Marine eubacteria

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<211> 250

<212> PRT

<213> Marine eubacteria

<400> 69

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Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val 20 25 30

Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60 .

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala 130 135 140

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp 145 150 155 160

Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys 165 170 175

Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190

Ile Ile Ile Val Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr Gly 195 200 205

Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr 210 215 220

Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile Trp Page 58 Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

230

<210> 70 <211> 751

<211> /JI

<213> Marine eubacteria

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<210> 71

<211> 250

<212> PRT

<213> Marine eubacteria

<400> 71

Met Gly Lys Leu Leu Leu Ile Leu Gly Ser Val Ile Ala Leu Pro Thr $1 \hspace{1cm} 5 \hspace{1cm} 10 \hspace{1cm} 15$

Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val 20 25 30

Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

_		_									ST25					
Val 65	Ser	Gly	Leu	Val	Thr 70	Gly	Ile	Ala	Phe	Trp 75	His	Tyr	Met	Tyr	Met 80	
Arg	Gly	Val	Trp	11e 85	Glu	Thr	Gly	Ser	Ser 90	Pro	Thr	val	Phé	Arg 95	Tyr	
Ile	Asp	Trp	Leu 100	Leu	Thr	val	Pro	Leu 105	Leu	Ile	Cys	Glu	Phe 110	Tyr	Leu	
Ile	Leu	Ala 115	Ala	Ala	Thr	Asn	val 120	Ala	Gly	Ser	Leu	Phe 125	Lys ,	Lys	Leu	
Leu	Val 130	Gly	Ser	Leu	val	Met 135	Leu	val	Phe	Gly	Tyr 140	Met	GТу	Glu	Ala	
Gly 145	Ile	Met	Ala	Ala	Trp 150	Pro	Ala	Phe	Ile	11e 155	Glу	Cys	Leu	Ala	Trp 160	
val	Tyr	Met	Ile	Tyr 165	Glu	Leu	Trp	Ala	Gly 170	Glu	Gly	Lys	Ser ,	Ala 175	Cys	
Asn	Thr	Ala	Ser 180	Pro	Аlа	Val	Gln	Ser 185	Ala	Tyr	Asn	Thr	Меt 190	Met	Tyr	
Ile	Ile	11e 195	Val	Gly	Trp	Ala	11e 200	Tyr	Pro	Val	Gly	Tyr 205	Phe	Thr	Gly	
Tyr	Lėu 210	Met	Gly	Asp	Gly	Gly 215	Ser	Ala	Leu	Asn	Leu 220	Asn	Leų	Ile	Tyr	
Asn 225	Leu	Ala	Asp	Phe	Val 230	Asn	Lys	Ile	Leu	Phe 235	Gly	Leu	Ile	Ile	Trp 240	
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															ctgct	120
															ggaaa	180
															acatg	240
agag	ıgtgt	at g	gata	gaaa	ic tg	gtag	ttca	cct	actg	tct 60	ttag	atac	at t	gact	ggcta	300

•

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а	tgggtgaag	caggaataat	ggcagcttgg	cctgcattca	tcattggatg	tttagcatgg	480
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C	ctgctgtac	agtcagctta	caacacaatg	atgtatatca	tcatcgttgg	ttgggcaatt	600
t	atcctgtag	gttatttcac	aggttaccta	atgggtgacg	gtggatcagc	tcttaatcta	660
а	accttattt	ataaccttgc	tgactttgtt	aacaagattc	tatttggttt	aattatatgg	720
а	atgttgctg	ttaaagaatc	ttctaatgct	a			751

<210> 73

<211> 250

<213> Marine eubacteria

<400> 73

Met Gly Lys Leu Leu Leu Ile Leu Gly Ser Val Ile Ala Leu Pro Thr $1 \hspace{1cm} 5 \hspace{1cm} 10 \hspace{1cm} 15$

Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val 20 25 30

Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Met 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala 130 135 140

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp 145 150 155 160 Page 61

Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys 165 170 175

Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190

Ile Ile Ile Phe Gly Trp Ala Ile Tyr Leu Val Gly Tyr Phe Thr Gly 195 200 205

Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr 210 215 220

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Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

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<211>

<213> Marine eubacteria

<400> 74

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ctaactgtgc ctttactaat t	ttgtgagttc	tacttaatac	tagcagcagc	tactaacgtt	360
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aaccttatct ataaccttgc t	tgactttgtt	aacaagattc	tatttggttt	aattatatgg	720
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⁷⁵ 250

PRT

Marine eubacteria

<400> 75

Met Gly Lys Leu Leu Leu Ile Leu Gly Ser Val Ile Ala Leu Pro Thr 1 10 15

Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val 20 25 30

Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Ser Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala 130 135 140

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp 145 150 155 160

Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys 165 170 175

Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190

Ile Ile Ile Ala Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr Gly 195 200 205

Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr 210 215 220

Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile Trp 225 230 235 240

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agaggtgtat ggatagaaac tggtagttca cctactgtct ttagatacat tgactggcta									
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Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val 20 . 25 30									
Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45									
Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60									

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Met 65 70 75 80

Arg	Gly	Val	Trp	Ile 85	Glu	Thr	Gly	Asp	Ser 90	Pro	Thr	val	Phe	Arg 95	Tyr		
Ile	Asp	Trp	Leu 100	Leu	Thr	val	Pro	Leu 105	Leu	Ile	Cys	Glu	Phe 110	Tyr	Leu		
Ile	Leu	Ala 115	Ala	Ala	Thr	Asn	val 120	Ala	Gly	Ser	Leu	Phe 125	Lys,	Lys	Leu		
Leu	∨a1 130	Gly	Ser	Leu	٧al	Met 135	Leu	٧a٦	Phe	Gly	Туг 140	Met	Gly	Glu	Ala		
Gly 145	Ile	Met	Ala	Ala	Trp 150	Pro	Ala	Phe _.	Ile	Ile 155	Gly	Cys	Leu	Ala	Trp 160		
val	Tyr	Met	Ile	Туг 165	Glu	Leu	Trp _.	Ala	Gly 170	Glu	Gly	Lys	Ser	Ala 175	Cys	•	
Asn	Thr	Ala	Ser 180	Pro	Ala	Val	Gln	Ser 185	Ala	Tyr	Asn	Thr	меt 190	Met	Туг		
Ile	Ile	Ile 195	Val	Gly	Trp	Ala	Ile 200	Tyr	Pro	val	Gly	Tyr 205	Phe	Thr	Gly		
Tyr	Leu 210	Met	Gly	Asp	Glу	Gly 215	Ser	Ala	Leu	Asn	Leu 220	Asn	Leu	Ile	Туг		
Asn 225	Leu	Ala	Asp	Phe	va1 230	Asn	Lys	Ile	Leu	Phe 235	Gly	Leu	Ile	Ile	Trp 240		
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300

360

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aaccttattt	ataaccttgc	tgactttgtt	aacaagattc	tatttggttt	aattatatgg	720
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<210> 79

<211> 250

<212> PRT

<213> Marine eubacteria

<400> 79

Met Gly Lys Leu Leu Leu Ile Leu Gly Ser Val Ile Ala Leu Pro Thr 1 5 10 15

Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val 20 25 30

Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Ala 50 60

Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp His Cys Met Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala 130 135 140

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp 145 150 155 160

Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys Page 66 Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190

Ile Ile Val Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr Gly 195 200 205

Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr 210 215 220

Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile Trp 225 230 235 240

Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

<210> 80

<211> 750

<212> DNA

<213> Marine eubacteria

<400> 80

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<210> 81

<211> 250

<212> PRT

<213> Marine eubacteria

<400> 81

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Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60	•
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Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg Tyr 85 90 95 Page 69

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Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile 145 150 155	
Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu 165 170	ı Gly Lys Ser Ala Cys 175
Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr 180 185	Asn Thr Met Met Tyr 190
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Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn 210 215	ı Leu Asn Leu Ile Tyr 220
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Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala 130 135 140

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp 145 150 155 160

Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys 165 170 175 02716.0005.NPUS01.ST25.txt
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Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala 130 135 140

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp 145 150 155 160

Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys 165 170 175

Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190

Ile Ile Ile Val Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr Gly 195 200 205

Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr 210 215 220

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Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60								
Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Met 65 70 75 80								

Ile Asp Trp Leu Leu Pro Val Pro Leu Ala Ile Cys Glu Phe Tyr Leu Page 74

100

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Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr 210 215 220

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Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val 20 25 30, Page 77

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Arg Gly Val Trp Ile Glu Thr Gly Ser Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Glý Glu Ala 130 135 140

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp 145 150 155 160

Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys 165 170 175

Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190

Ile Ile Ile Phe Gly Trp Ala Ile Tyr Leu Val Gly Tyr Phe Thr Gly 195 200 205

Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr 210 215 220

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Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr Leu 100 105 110

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Page 81

Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr 210 215 220

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Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe Page 82

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Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

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agaggggtat	ggattgaaac	tggtgattcg	ccaactgtat	ttagatacat	tgattggtta	300
ctaacagttc	ctctagaaat	atgtgaattc	tacttaattc	ttgctgctgc	aactaatgtt	360
gctggatcat	tatttaagaa	attactagtt	ggttctcttg	ttatgcttgt	gtttggttac	420
atgggtgaag	caggaatcat	ggctgcatgg	cctgcattca	ttattgggtg	tttagcttgg	480
gtatacatga	tttatgaatt	atgggctgga	gaaggaaaat	ctgcatgtaa	tactgcaagt	540
cctgctgtgc	aatcagctta	caacacaatg	atgtatatta	tcatctttgg	ttgggcgatt	600
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aaccttatct	ataaccttgc	tgactttgtt	aacaagattc	taattggttt	aattatatgg	720
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<210> 101

<211> 250

<212> PRT

<213> Marine eubacteria

<400> 101

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Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val 20 25 30,

Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Val Ile Cys Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala 130 135 140

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp 145 150 155 160

Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys 165 170 175

Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190

Ile Ile Ile Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr Gly 195 200 205

Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr 210 220

Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile Trp 225 230 235 240

Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

<210> 102

<211> 751

<212> DNA

<213> Marine eubacteria

<400> 102

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103 250 <210>

<211> <212>

PRT <213> Marine eubacteria

<400>

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Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val

Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Pro Gly Leu Ile Thr Asp Ile Ala Phe Trp His Tyr Met Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Ile Cys Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala 130 135 140

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp 145 150 155 160

Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys 165 170 175

Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190

Ile Ile Ile Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr Gly
195 200 205

Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr Page 86

Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile Trp 225 230 235 240

Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

<210> 104

<211> 751

<212> DNA

<213> Marine eubacteria

<400> 104

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ttattagcat	ctactgtatt	tttctttgtt	gaaagagata	gagtttctgc	aaaatggaaa	180
acatcattaa	ctgtacctgg	tcttattact	gatattgctt	tctggcatta	catgtacatg	240
agaggggtat	ggattgaaac	tggtgattcg	ccaactgtat	ttagatacat	tgattggtta	300
ctaacagttc	ctctacaaat	atgtgaattc	tacttaattc	ttgctgctgc	aactaatgtt	360
gctggatcat	tatttaagaa	attactagtt	ggttctcttg	ttatgcttgt	gtttggttac	420
atgggtgaag	caggaatcat	ggctgcatgg	cctgcattca	ttattgggtg	tttagcttgg	480
gtatacatga	tttatgaatt	atgggctgga	gaaggaaaat	ctgcatgtaa	tactgcgagt	540
cctgctgtgc	aatcagctta	caacacaatg	atgtatatta	tcatctttgg	ttgggcgatt	600
tatcctgtag	gttatttcac	aggttacctg	atgggtgacg	gtggatcagc	tcttaactta	660
aaccttatct	ataaccttgc	tgactttgtt	aacaagattc	tatttggttt	aattatatgg	720
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<210> 105

<211> 249

<212> PRT

<213> Marine eubacteria

<400> 105

Met Gly Lys Leu Leu Leu Ile Leu Gly Ser Val Ile Ala Leu Pro Thr $1 \hspace{1cm} 10 \hspace{1cm} 15$

Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val 20 25 30

Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe 35 40 45

Phe	va1 50	Glu	Arg	Asp	Arg						Lys 60		Seņ	Leu	Thr		
Va1 65	Pro	Gly	Leu	Ile	Thr 70	Asp	Ile	Ala	Phe	Trp 75	His	Tyr	Met	Tyr	Met 80		
Arg	Gly	∨al	Trp	Ile 85	Glu	Thr	Gly	Asp	Ser 90	Pro	Thr	٧a٦	Phe	Arg 95	туг		
Ile	Asp	Trp	Leu 100	Leu	Thr	val	Pro	Leu 105	Gln	Ile	Cys	Glu	Phé 110	Tyr	Leu		
Ile	Leu	Ala 115	Ala	Ala	Thr	Asn	Val 120	Ala	Gly	Ser	Leu	Phe 125	Lys	Lys	Leu		
Leu	Val 130	Gly	Ser	Leu	٧al	Met 135	Leu	val	Phe	Gly	Tyr 140	Met	Gly	Glu	Ala		
Gly 145	Ile	Met	Ala	Ala	Trp 150	Pro	Ala	Phe	Ile	17e 155	G1y	Cys	Leu	Ala	Trp 160		
Val	Tyr	Met	Ile	Tyr 165	Glu	Leu	Trp	Ala	Gly 170	Glu	Gly	Lys	Ser	Ala 175	Cys		
Asn	Thr	Ala	Ser 180	Pro	Ala	val	Gln	Ser 185	Ala	Tyr	Asn	Thr	Met 190	Met	Tyr		
Ile	Ile	Ile 195	Phe	Gly	Trp	Ala	Ile 200	Tyr	Pro	Val	Gly	Tyr 205	Phe	Thr	Gly		
Tyr	Leu 210	Met	Gly	Asp	Gly	G]y 215	Ser	Ala	Leu	Asn	Leu 220	Asn	Leu	Ile	Tyr		
Asn 225	Leu	Ala	Asp	Phe	Val 230	Asn	Lys	Ile	Leu	Phe 235	Gly	Leu	Ile	Ile	Trp 240		
Asn	Val	Ala	Val	Lys 245	Glu	Ser	Ser	Asn									
<210 <211 <212 <213	> 7 !> 0	.06 '48 'NA larin	ie eu	bact	eria	L							,				
<400 atgg		.06 .at t	atta	.ctga	it at	tagg	tagt	gtt	attg	ıcac	ttcc	taca	tt t	gctg	caggt		60
ggtg	gtga	.cc t	tgat	gcta	g tg	atta	cact	ggt	gttt	ctt	tttg	gtta	gt t	actg	ctgct	1	L20
ttat	tago	at c	tact	gtat	t tt	tctt	tgtt		agag age		gagt	ttct	gc a	aaat	ggaaa	1	L 80

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ctaacagttc	ctctacaaat	atgtgaattc	tacttaattc	ttgctgctgc	aactaatgtt	360
gctggatcat	tatttaagaa	attactagtt	ggttctcttg	ttatgcttgt	gtttggttac	420
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gtatacatga	tttatgaatt	atgggctgga	gaaggaaaat	ctgcatgtaa	tactgcgagt	540
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aaccttatct	ataaccttgc-	tgactttgtt	aacaagattc	tatttggttt	aattatatgg	720
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<210> 107

<211> 250

<212> PRT

<213> Marine eubacteria

<400> 107

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Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Gly Tyr Thr Gly Val 20 25 30

Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Pro Gly Leu Ile Thr Asp Ile Ala Phe Trp His Tyr Met Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Ser Leu Gln Ile Cys Glu Phe Tyr Leu $100 \hspace{1cm} 105 \hspace{1cm} 110$

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala 130 135 140 Page 89

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp 150 155 , 160

Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys 165 170 175

Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190

Ile Ile Ile Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr Gly 195 200 205

Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr 210 215 220

Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile Trp 225 230 235 240

Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

<210> 108

<211> 751

<212> DNA

<213> Marine eubacteria

<400> 108

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<210> 109

<211> 250 <212> PRT

<213> Marine eubacteria

<400> 109

Met Gly Lys Leu Leu Leu Ile Leu Gly Ser Val Ile Ala Leu Pro Thr 1 5 10 15

Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val 20 25 30

Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Pro Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Ala Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Glu Ile Cys Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala 130 135 140

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp 145 150 155 160

Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys 165 170 175

Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190

Ile Ile Ile Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr Gly 195 200 205

Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr 210 220

O2716.0005.NPUS01.ST25.txt Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile Trp 225 230 235 240

Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

<210>	110	
<211>	751	
<212>	DNA	

<213> Marine eubacteria

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751

<210> 111

<211> 250

<212> PRT

<213> Marine eubacteria

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<400> 111

Met Gly Lys Leu Leu Val Met Leu Gly Ser Val Ile Ala Leu Pro Thr $1 \hspace{1cm} 5 \hspace{1cm} 10 \hspace{1cm} 15$

Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val 20 25 30

Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe 35 40 45

Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

va1 65	Ser	Gly	Leu	Val	Thr 70	Gly	Ile	Ala	Phe	Trp 75	His	Tyr	Met	Tyr	Met 80	
Arg	Gly	val	Trp	Ile 85	Glu	Thr	Gly	Asp	Ser 90	Pro	Thr	٧a٦	Phe	Arg 95	Tyr	
Ile	Asp	Trp	Leu 100	Leu	Thr	٧a٦	Pro	Leu 105	Leu	Ile	Cys	Glu	Phe 110	Tyr	Leu	
Ile	Leu	Ala 115	Ala	Ala	Thr	Asn	val 120	Ala	Gly	Ser	Leu	Phe 125	Lys ,	Lys	Leu	
Leu	Val 130	Gly	Ser	Leu	val	Met 135	Leu	val	Phe	Gly	Tyr 140	Met	Gly	Glu	Ala	
Gly 145	Ile	Met	Ala	Ala	Trp 150	Pro	Ala	Phe	Ile	Ile 155	GТу	Cys	Leu	Ala	Trp 160	
val	Tyr	Met	Ile	Туг 165	Glu	Leu	Тгр	Ala	Gly 170	Glu	Gly	Lys	Seŗ	Ala 175	Cys	
Asn	Thr	Ala	Ser 180	Pro	Ala	val	Gln	Ser 185	Ala	Tyr	Asn	Thr	Меt 190	Met	Tyr	
Ile	Ile	Ile 195	Phe	Gly	Тгр	Ala	Ile 200	Tyr	Pro	Val	Gly	Tyr 205	Phe	Thr	Gly	
Tyr	Leu 210	Met	Gly	Asp	Gly	G]y 215	Ser	Ala	Leu	Asn	Leu 220	Asn	Leú	Ile	Tyr	
Asn 225	Leu	Ala	Asp	Phe	Val 230	Asn	Lys	Ile	Leu	Phe 235	Gly	Leu	Ile	Ile	Trp 240	
Asn	Val	Ala	Val	Lys 245	Glu	Ser	Ser	Asn	Ala 250						·	
<210 <211 <212 <213	> 7 > D	.12 '51 NA larin	ie eu	bact	eria	L							,			
<400 ataa		.12 at t	atta	ataa	t at	tagg	tagt	att	atto	cac	ttcc	aaca	tt t	מככמ	ctggt	60
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															acatg	240
									age						_	

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gtatacatga	tttatgaatt	atgggctgga	gaaggaaagt	ctgcatgtaa	cactgcaagt	540
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aaccttatct	ataaccttgc	tgactttgtt	aacaagattc	tatttggttt	aattatatgg	720
aatottocto	ttaaagaatc	ttctaatgct	а			751

<210> 113

<400> 113

Met Gly Lys Arg Leu Val Ile Leu Gly Ser Val Ile Ala Leu Pro Thr $1 \hspace{1cm} 5 \hspace{1cm} 10 \hspace{1cm} 15$

Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val 20 25 30

Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala 130 135 140

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp Page 94

<211> 250

<212> PRT

<213> Marine eubacteria

Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys 165 170 175

Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190

Ile Ile Ile Phe Gly Trp Ala Ile Tyr Leu Val Gly Tyr Phe Thr Gly 195 200 205

Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr 210 215 220

Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile Trp 225 230 235 240

Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

150

<210> 114

<211> 751

<212> DNA

<213> Marine eubacteria

<400> 114

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<400> 115

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Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val 20 25 30

Ser Phe Trp Leu Val Thr Ala Ala Pro Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala 130 135 140

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp 145 150 155 160

Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys 165 170 175

Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190

Ile Ile Ile Phe Gly Trp Ala Ile Tyr Leu Val Gly Tyr Phe Thr Gly
195 200 205

Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr 210 215 220

Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile Arg 225 230 235 240

Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

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<213> Marine eubacteria	
<400> 116	
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ccattagcat ctactgtatt tttctttgtt gaaagagaca gagtttctgc taaatggaaa	180
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gctggttctt tattcaagaa attactagtt ggttctcttg ttatgcttgt gtttggttac	420
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taccttgtag gttatttcac tggttaccta atgggtgacg gtggatcagc tcttaactta	660
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Met Gly Lys Gly Leu Leu Met Leu Gly Ser Val Ile Ala Leu Pro Ser $1 \hspace{1cm} 10 \hspace{1cm} 15$

Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val 20 25 30

Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Arg Val Ala Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Met 65 70 75 80 Page 97

Arg	Gly	Val	Trp	Va1 85	Glu	Thr	Gly	Glu	Ser 90	Pro	Thr	val	Phe	Arg 95	Tyr	
Ile	Asp	Trp	Leu 100	Leu	Thr	val	Pro	Leu 105	Leu	Ile	Cys	Glu	Phe 110	Tyr	Leu	
Ile	Leu	Ala 115	Ala	Ala	Thr	Asn	Val 120	Ala	Gly	Ser	Leu	Phe 125	Lys	Lys	Leu	
Leu	Ile 130	Gly	Ser	Leu	Val	Met 135	Leu	val	Phe	Gly	Туг 140		Gly	Glu	Ala	
Gly 145	Ile	Met	Ala	Ala	Trp 150	Pro	Ala	Phe	Ile	Ile 155	Gly	Cys	Leų	Ala	Trp 160	
Phe	Tyr	Met	Ile	Туг 165	Glu	Leu	Trp	Ala	Gly 170	Glu	Gly	Lys	Ser	Ala 175	Cys	
Asn	Thr	Ala	Ser 180	Pro	Ala	٧al	Gln	Ser 185	Ala	Tyr	Asn	Thr	меt 190	Met	Туг	
Ile	Ile	Ile 195	Ile	Gly	Trp	Ala	Ile 200	Tyr	Pro	val	Gly	Tyr 205	Phé	Thr	Gly	
Tyr	Leu 210	Met	Gly	Asp	Gly	Gly 215	Ser	Ala	Leu	Asn	Leu 220	Asn	Leu	Ile	Tyr	
Asn 225	Leu	Ala	Asp	Phe	va1 230	Asn	Lys	Ile	Leu	Phe 235	Gly	Leu	Ile	Ile	Trp 240	
His	val	Ala	Val	Lys 245	Glu	Ser	Ser	Asn	Ala 250				·			
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acat	cgti	aa o	cagta	atcto	gg to	ttgt	tact	ggt	tatto	jctt	tttg	gcat	ta d	catgt	cacatg	240
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aacctaattt ataaccttgc tga	acttcgtt aacaagattc	tatttggttt aattatctgg	720
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<213> Marine eubacteria

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Met Gly Lys Leu Leu Leu Ile Leu Gly Ser Val Ile Ala Leu Pro Ser $1 \hspace{1cm} 15$

Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Gly Asp Tyr Thr Gly Val 20 25 30

Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Ile Glu Arg Asp Arg Val Ala Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Met Tyr Met 65 70 75 80

Arg Gly Val Trp Val Glu Thr Gly Glu Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala 130 135 140

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Val Gly Cys Leú Ala Trp 145 150 155 160

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Phe Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys
165 170 Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190 Ile Ile Ile Gly Trp Ala Ile Tyr Pro Leu Gly Tyr Phe Thr Gly 195 200 205 Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr 210 215 220 Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile Trp 225 230 235 240 His Val Ala Val Lys Glu Ser Ser Asn Ala 245 250 <210> 120 751 <211> DNA Marine eubacteria <400> 120 atgggtaaat tattattgat cttaggtagt gttattgcqc ttccttcatt tgcagctggt 60 ggcggcgacc ttgatgctgg tgattacact ggtgttagtt tttggttagt gactgcagct 120 cttttggctt caactgtatt tttctttatt gaaagagata gagttgctgc taaatggaag 180 acatctttaa cagtatctgg tctagttact ggtattgctt tctggcatta catgtacatg 240 agaggtgttt gggtcgaaac tggtgaatca ccaactgtat tcagatatat tgactggcta 300 cttacagtgc ctttattaat atgtgagttt tatctgattc ttgcagctgc aactaatgtt 360 gctggttctt tatttaagaa gcttttagtt ggttctcttg taatgcttgt atttggttat 420 atgggcgaag caggaattat ggcagcttgg cctgcattca ttgttggatg'tttagcttgg 480 ttctatatga tttatgagct atgggctgga gaaggaaaat ctgcatgcaa tactgcaagt 540 ccagctgttc aatcagcata caacacaatg atgtatatta ttatcattgg ttgggctatt 600 tatcctcttg ggtactttac tggttaccta atgggtgacg gcggatcagc cttaaactta 660 aacctaattt ataaccttgc tgactttgtt aacaagattc tatttggttt aatcatatgg 720 catgtcgctg ttaaagaatc ttctaatgct a 751 <210> 121

<210> 121 <211> 250 <212> PRT <213> Marine eubacteria <400> 121

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Phe Ala Ala Gly Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val 20 25 30

Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Ile Glu Arg Asp Arg Val Ala Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr Met 65 70 75 80

Arg Gly Val Trp Val Glu Thr Gly Glu Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr Leu $100 \hspace{1cm} 105 \hspace{1cm} 110$

Ile Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Ile Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala 130 135 140

Gly Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp 145 150 155 160

Val Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys 165 170 175

Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190

Ile Ile Ile Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr Gly
195 200 205

Tyr Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr 210 215 220

Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile Trp 225 230 235 240

His Val Ala Val Lys Glu Ser Ser Asn Ala 245 250 Page 101

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ttattagcct caactgtttt ctttttatt gaaagagaca gagttgctgc aaaatggaaa	180
acgtcgttaa cagtatctgg ccttgttact ggtattgctt tttggcacta cttgtatatg	240
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gctggttctt tatttaaaaa gctattaatt ggttctcttg tgatgcttgt gtttggttac	420
atgggtgaag caggaatcat ggcggcttgg cctgcattca ttattgggtg cttagcttgg	480
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taccctgtag gttactttac tggttaccta atgggtgacg gcggatctgc cttaaactta	660
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Ser Phe Gly Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45	
Phe Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60	

Arg Gly Val Trp Val Glu Thr Gly Glu Thr Pro Thr Val Phe Arg Tyr Page 102

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr Met 65 70 75 80

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr Leu 105 Leu Ala Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115

Leu Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala 130 135 140

Gly Ile Met Ala Ala Leu Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp 145 150 155 160

Ile Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys 165 170 175

Asn Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr 180 185 190

Ile Ile Ile Phe Gly Trp Leu Ile Tyr Pro Val Gly Tyr Ala Ser Gly 195 200 205

Tyr Leu Met Gly Asp Gly Gly Ser Ala Met Asn Leu Asn Leu Ile Tyr 210 215 220

Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile Trp 225 230 235

Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

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<213> Marine eubacteria

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Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Phe Ile Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr Met 65 70 75 80

Arg Gly Val Trp Val Asp Ser Trp Asn Pro Glu Thr Gly Met Gly Glu 85 90 95

Ser Pro Thr Glu Phe Arg Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu 100 105 110

Leu Ile Cys Glu Phe Tyr Leu Ile Leu Ala Ala Ala Thr Asn Val Ala 115 120 125

Gly Ser Leu Phe Lys Lys Leu Leu Val Gly Ser Leu Val Met Leu Ile 130 135 140

Ala Gly Tyr Met Gly Glu Ser Gly Asn Ala Asn Val Met Ile Ala Phe 145 150 155 160

Val Val Gly Cys Leu Ala Trp Leu Tyr Met Ile Tyr Glu Leu Trp Ala 165 170 , 175

Gly Glu Gly Lys Ala Ala Cys Asn Thr Ala Ser Pro Ala Val Gln Ser 190

Ala Tyr Asn Thr Met Met Trp Ile Ile Ile Val Gly Trp Ala Ile Tyr 195 200 205

Pro Ala Gly Tyr Ala Ala Gly Tyr Leu Met Gly Gly Glu Ser Val Tyr 210 215 220

Ala Ser Asn Leu Asn Leu Ile Tyr Asn Leu Ala Asp Phe Val Asn Lys

Ile Leu Phe Gly Leu Ile Ile Trp His Val Ala Val Lys Glu Ser Ser 245 250 255

Asn Ala

<210> <211> 126

775

DNA Marine eubacteria <400> 126 atgggtaaag gattactgat gttaggtagt gttattgcac ttccatcctt tgcagctggt 60 ggaggcaact taaatgcagc tgatgtaact ggtgtatctt tttggctagt tactgccgct 120 ttacttgctt caacagtatt cttttttatt gaaagagata gagtttctgc aaaatggaag 180 acatcactaa cagtatctgg tttagttact ggtattgctt tttggcatta cctttacatq 240 agaggtgttt gggttgattc ttggaatcct gaaacaggaa tgggagaatc tccaactgaa 300 tttagatata ttgattggtt actaacagta cctttattaa tttgtgagtt ttatctaata 360 ttagctgctg caacaaatgt tgctggttca ttattcaaaa aattattagt tggttcattg 420 gtcatgctta ttgcaggata catgggtgaa tctggtaatg ccaatgtgat gattgcattc 480 gtagttggat gcttagcatg gttgtatatg atatatgaat tgtgggctgg'tgaaggtaaa

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Marine eubacteria

540

600

660

720

775

<400> 127

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Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe 35 40 45 .

Phe Ile Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr Met 70 75 80

Arg Gly Val Trp Val Asp Ser Trp Thr Gly Pro Gly Thr Gly Glu Ser 85 90 95

Pro Thr Glu Phe Arg Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Leu 100 105 110

Ile Cys Glu Phe Tyr Leu Ile Leu Ala Ala Ala Thr Asn Val Ala Gly 115 120 125

Ser Leu Phe Lys Lys Leu Leu Val Gly Ser Leu Val Met Leu Ile Ala 130 135 140

Gly Tyr Met Gly Glu Ser Gly Asn Ala Asn Val Met Ile Ala Phe Val 145 150 155 160

Val Gly Cys Leu Ala Trp Leu Tyr Met Ile Tyr Glu Leu Trp Ala Gly 165 170 175

Glu Gly Lys Ala Ala Cys Asn Thr Ala Ser Pro Ala Val Gln Ser Ala 180 185 190

Tyr Asn Thr Met Met Trp Ile Ile Ile Val Gly Trp Ala Ile Tyr Pro 195 200 205

Ala Gly Tyr Ala Ala Gly Tyr Leu Met Gly Gly Glu Ser Val Tyr Ala 210 215 220

Ser Asn Leu Asn Leu Ile Tyr Asn Leu Ala Asp Phe Val Asn Lys Ile 225 230 235 240

Leu Phe Gly Leu Ile Ile Trp His Val Ala Val Lys Glu Ser Ser Asn Page 106 Αla

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129 249 <210>

<211>

<212> PRT

<213> Marine eubacteria

<400> 129

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Phe Ala Ala Gly Gly Gly Asp Leu Asp Ile Gly Asp Ser Val Gly Val 20 25 30

Ser Phe Trp Leu Val Thr Ala Ala Met Leu Ala Ala Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

							02	716	റററട	NPH	S01	ST25	tyt					
\ 6	⁄al 65	Ser	Gly	Leu	Ile	Thr 70						His		Leu	Tyr	Met 80		
۵	Arg	Gly	val	Тгр	Ile 85	Asp	Thr	Gly	Gly	Ser 90	Pro	Thr	val	Phe	Arg 95	Tyr		
I	Ile	Asp	Тгр	Leu 100	Leu	Thr	val	Pro	Leu 105	Gln	Met	val	Glu	Phe 110	Tyr	Leu		
1	Ile	Leu	Ala 115	Ala	Cys	Thr	Asn	Val 120	Ala	Gly	Ser	Leu	Phe 125	Lys	Lys	Leu		
L		val 130	Gly	Ser	Leu	val	Met 135	Leu	Glу	Ala	G]y	Phe 140	Αla	GÌý	Glu	Ala		
1	51y 145	Leu	Ala	Pro	Ala	Leu 150	Pro	Ala	Phe	Ile	Leu 155	Glу	Met	Αla	Gly	Trp 160		
٧	/al	Tyr	Met	Ile	Tyr 165	Glu	Leu	Tyr	Met	Gly 170	Glu	Gly	Lys	Ala	Ala 175	val		
S	Ser	Thr	Ala	Ser 180	Pro	Ala	val	Asn	Ser 185	Аla	Tyr	Asn	Ala	меt 190	Met	Met		
. I	īle	Ile	Val 195	Phe	Gly	Trp	Ser	11e 200	Tyr	Pro	Leu	Gly	Tyr 205	val	Ala	Gly		
Т	Гуг	Leu 210	Met	Gly	Ala	val	Asp 215	Pro	Ser	Thr	Leu	Asn 220	Leu	Ile	Tyr	Asn		
L 2	_eu 225	Ala	Asp	Phe	Ile	Asn 230	Lys	Ile	Leu	Phe	Gly 235	Leu	Ile	Ile	Trp	His 240		
٧	/al	Ala	Val	Lys	G1u 245	Ser	Ser	Asn	Ala									
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										_		_	_	_	_	ggaaa	180	
													_		•	acatg	240	
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•

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gttgctgtta	aagaatcttc	taatgcta	•			748

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<211> 249

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<213> Marine eubacteria

<400> 131

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Phe Ala Ala Gly Gly Gly Asp Leu Asp Ile Gly Asp Ser Val Gly Val 20 25 30

Ser Phe Trp Leu Val Thr Ala Ala Met Leu Ala Ala Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Asp Thr Gly Gly Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Met Val Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Cys Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Val Gly Ser Leu Val Met Leu Gly Ala Gly Phe Ala Gly Glu Ala 130 135 140

Gly Leu Ala Pro Ala Leu Pro Ala Phe Ile Leu Gly Met Ala Gly Trp 145 150 155 160 Page 109

Val Tyr Met Ile Tyr Glu Leu Tyr Met Gly Glu Gly Lys Ala Ala Val 165 170 175

Ser Thr Ala Ser Pro Ala Val Asn Ser Ala Tyr Asn Ala Met Met Met 180 185 190

Ile Ile Val Phe Gly Trp Ser Ile Tyr Pro Leu Gly Tyr Val Ala Gly 195 200 205

Tyr Leu Met Gly Ala Val Asp Pro Ser Thr Leu Asn Leu Ile Tyr Asn 210 220

Leu Ala Asp Phe Ile Asn Lys Ile Leu Phe Gly Leu Ile Ile Trp His 225 230 235 240

Val Ala Val Lys Glu Ser Ser Asn Ala 245

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<211> 748

<212> DNA

<213> Marine eubacteria

<400> 132

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<210> 133 <211> 251

<212> PRT

<213> Marine eubacteria

<400> 133

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Phe Ala Ala Gly Gly Asp Leu Asp Ile Gly Asp Ser Val Gly Val
20 25 30

Ser Phe Trp Leu Val Thr Ala Ala Met Leu Ala Ala Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr Met 65 70 75 80

Arg Gly Val Trp Val Glu Thr Gly Asp Ser Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Met Val Glu Phé Tyr Leu 100 105 110

Ile Leu Ala Ala Cys Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Ile Gly Ser Leu Val Met Leu Ile Gly Gly Phe Leu Gly Glu Ala 130 135 140

Gly Met Ile Asp Val Thr Leu Ala Phe Val Ile Gly Met Ala Gly Trp 145 150 155 160

Leu Tyr Met Ile Tyr Glu Leu Tyr Met Gly Glu Gly Lys Ala Ala Val 165 170 175

Ser Thr Ala Ser Pro Ala Val Asn Ser Ala Tyr Asn Ala Met Met Leu 180 185 190

Ile Ile Val Val Gly Trp Ser Ile Tyr Pro Ala Gly Tyr Val Ala Gly 195 200 205

Tyr Leu Met Gly Gly Glu Gly Val Tyr Ala Ser Asn Leu Asn Leu Ile 210 215 220

Tyr Asn Leu Ala Asp Phe Ile Asn Lys Ile Leu Phe Gly Leu Ile Ile 225 230 235 240

02716.0005.NPUS01.ST25.txt Trp His Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

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ttaactgtac cactacaaat ggtagagttt tatctgatat tagctgcatg taccaatgtt	360
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tatcctgctg gatatgttgc tggctatctt atgggcggtg aaggagtata tgcctcaaat	660
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<213> Marine eubacteria	
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Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ala Thr Val Phe Phe 35 40 45	

Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr Met 65 70 75 80

Arg Gl	y Val	Trp	Ile 85	Glu	Thr	Gly	Glu	Thr 90	Pro	Thr	Val	Phe	Arg 95	Tyr		
Ile As	р Тгр	Leu 100	Leu	Thr	val	Pro	Leu 105	Leu	Met	Val	Glu	Phe 110	Tyr	Leu		
Ile Le	u Ala 115	Аlа	Cys	Thr	Asn	Val 120	Ala	Gly	Ser	Leu	Phe 125	Lyś	Lys	Leu		
Leu Gl 13	y Gly O	Ser	Leu	۷al	Met 135	Leu	Ile	Аlа	Gly	Туг 140	Met	Gly	Glu	Ser		
Gly Se 145	r Leu	Pro	va1	Leu 150	Pro	Ala	Phe	Ile	val 155	Gly	Cys	Leu	Ala	Trp 160		
Phe Ty	r Met	Ile	Туг 165	Glu	Leu	Туг	Ala	Gly 170	Glu	Gly	Lys	Ala	Ala 175	Val		
Thr Th	r Ala	Ser 180	Pro	Ala	val	Met	Ser 185	Ala	Tyr	Asn	Thr	Met 190	Met	Leu		
Ile Il	e Val 195	val	Gly	Trp	Ala	11e 200	Tyr	Pro	Ala	Gly	Tyr 205	Ala	Ala	Gly		
Tyr Le 21	u Met O	Gly	Gly	Asp	Gly 215	val	Tyr	Ala	Gln	Asn 220	Leu	Asn	Val	Ile	,	
Tyr As 225	n Leu	Ala	Asp	Phe 230	٧a٦	Asn	Lys	īle	Leu 235	Phe	Gly	Leu	Val	Ile 240		
Тгр Ні	s Val	Ala	Val 245	Lys	Glu	Ser	Ser	Asn 250	Ala			,				
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ctctta													_	_		180
acatca																240
agaggt														_		300

360

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gcgggttcat tatttaagaa actacttggt ggt	tcgcttg taatgcttat tgcaggatat 420
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cctgctgtta tgtctgcata caatactatg atg	ttgatta tcgtagtagg ttgggcaatt 600
tacccagctg gatatgctgc tggttaccta atg	gggtggtg atggcgtata tgctcagaat 660
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<210> 137

<211> 251

<212> PRT

<213> Marine eubacteria

<400> 137

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Phe Ala Ala Ser Gly Gly Asp Leu Asp Ser Ser Asp Leu Thr Gly Val 20 25 30'

Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ala Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Leú Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Glu Thr Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Met Val Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Cys Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Gly Gly Ser Leu Val Met Leu Ile Ala Gly Tyr Met Gly Glu Ser 130 140

Gly Ser Leu Pro Val Leu Pro Ala Phe Ile Val Gly Cys Leu Ala Trp 145 150 155 , 160

Phe Tyr Met Ile Tyr Glu Leu Tyr Ala Gly Glu Gly Lys Ala Ala Val Page 114 Thr Thr Ala Ser Pro Ala Val Met Ser Ala Tyr Asn Thr Met Met Leu 180 185 190

Ile Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala Gly 195 200 205

Tyr Leu Met Gly Gly Asp Gly Val Tyr Ala Gln Asn Leu Asn Val Ile 210 215 220

Tyr Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Val Ile 225 230 235 240

Trp His Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

<210> 138

<211> 754

<212> DNA

<213> Marine eubacteria

<400> 138

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<210> 139

<211> 251

<212> PRT

<213> Marine eubacteria

<400> 139

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acatcactta cagtttctgg tttagttact ggtattgcat tctggcatta tctctatatg	240
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tacccggctg gatatgctgc tggataccta atgggtggtg atggcgtata tgctcagaat	660
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1 5 10 15	
Gly Gly Asp Leu Asp Ser Ser Asp Leu Thr Gly Val Ser Phe Trp Leu 20 25 30	
Val Thr Ala Ala Leu Leu Ala Ala Thr Val Phe Phe Val Glu Arg 35 40 45	
Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu Thr Val Ser Gly Leu 50 60	
Val Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr Met Arg Gly Val Trp 65 70 75 80	

Ile Glu Thr Gly Glu Thr Pro Thr Val Phe Arg Tyr Ile Asp Trp Leu 85 90 95 Page 117

Leu	Thr	val	Pro 100	Leu	Leu	Met	Val	Glu 105	Phe	Tyr	Leu	Ile	Leu 110	Ala	Ala	
Cys	Thr	Asn 115	val	Ala	Gly	Ser	Leu 120	Phe	Lys	Lys	Leu	Leu 125	Gly	Gly	Ser	
Leu	Val 130	Met	Leu	Ile	Ala	Gly 135	Tyr	Met	Gly	Glu	Ser 140	Gly	Ser	Leu	Pro	
Val 145	Leu	Pro	Αla	Phe	Ile 150	val	Gly	Cys	Leu	Ala 155	Тгр	Phe	Tyr	Met	Ile 160	
Tyr	Glu	Leu	Tyr	Ala 165	Gly	Glu	Gly	Lys	Ala 170	Ala	val	Thr	Thr	Ala 175	Ser	
Pro	Ala	val	Met 180	Ser	Ala	Tyr	Asn	Thr 185	Met	Met	Leu	Ile	11e 190	٧a٦	Val	
Gly	Trp	А]а 195	Ile	Tyr	Pro	Ala	G]y 200	Tyr	Ala	Ala	Gly	Tyr 205	Leu	Met	Gly	
Gly	Asp 210	Gly	Val	Tyr	Ala	Gln 215	Aśn	Leu	Asn	val	11e 220	Tyr	Asn	Leu	Ala	
Asp 225	Phe	val	Asn	Lys	Ile 230	Leu	Phe	Gly	Leu	Val 235	Ile	Trp	Hiş	٧a٦	Ala 240	
Val	Lys	Glu	Ser	Ser 245	Asn	Ala										
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atcg	aaac	tg ç	gtgaa	acgo	c aa	acagt	tattı	t aga	ıtata	ittg	atto	gttg	gct _, a	acto	ttcct	300
ttgc	taat	gg t	tgag	jttct	a ct	taat	cctt	gca	ıgcgt	gca	caaa	tgtt	gc g	gggtt	catta	360
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tatgctgctg	gttacctaat	gggtggtgat	ggcgtatatg	ctcagaattt	aaacgttata	660
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<210> 143

<211> 251

<212> PRT <213> Marine eubacteria

<400> 143

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Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ala Thr Val Phe 35 40 45

Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60 ,

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Glu Thr Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Met Val Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Cys Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Ile Gly Ser Leu Val Met Leu Ile Ala Gly Tyr Met Gly Glu Ser 130 135 140

Gly Ser Leu Pro Val Leu Pro Ala Phe Leu Val Gly Cys Ala Ala Trp 145 150 155 160

Leu Tyr Met Ile Tyr Glu Leu Tyr Ala Gly Glu Gly Lys Ala Ala Val 165 170 175 02716.0005.NPUS01.ST25.txt
Thr Thr Ala Ser Pro Ala Val Met Ser Ala Tyr Asn Thr Met Met Leu
180 185 190

Ile Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala Gly 195 200 205

Tyr Leu Met Gly Gly Asp Gly Val Tyr Ala Gln Asn Leu Asn Val Ile 210 215 220

Tyr Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Val Ile 225 230 235 240

Trp His Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

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<213> Marine eubacteria

<400> 144

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Met Gly Lys Leu Leu Leu Ile Leu Gly Gly Val Ile Ala Leu Pro Ser $1 \hspace{1cm} 5 \hspace{1cm} 10 \hspace{1cm} 15$

<210> 145

<211> 250

<212> PRT

<213> Marine eubacteria

<400> 145

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Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ala Thr Val Phe Phe 35 40 45

Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 60

Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr Met 65 70 75 80

Arg Gly Val Trp Ile Glu Thr Gly Glu Thr Pro Thr Val Phe Arg Tyr 85 90 95

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Met Val Glu Phe Tyr Leu 100 105 110

Ile Leu Ala Ala Cys Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu 115 120 125

Leu Ile Gly Ser Leu Val Met Leu Ile Ala Gly Tyr Met Gly Glu Ser 130 135 140

Gly Ser Leu Pro Val Leu Pro Ala Phe Leu Val Gly Cys Ala Ala Trp 145 150 155 160

Leu Tyr Met Ile Tyr Glu Leu Tyr Ala Gly Glu Gly Lys Ala Ala Val 165 170 175

Thr Thr Ala Ser Pro Ala Val Met Ser Ala Tyr Asn Thr Met Met Leu 180 185 190

Ile Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala Gly
195 200 205

Tyr Leu Met Gly Gly Asp Gly Val Tyr Ala Gln Asn Leu Asn Val Ile 210 215 220

Tyr Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Val Ile 225 230 235 240

Trp His Val Ala Val Lys Glu Ser Ser Asn 245 250

<210> 146 <211> 751

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<210> 147 <211> 251 <212> PRT <213> Marine eubacteria
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Phe Ala Ala Ser Gly Gly Asp Leu Asp Ser Ser Asp Leu Thr Gly Val 20 25 30
Ser Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ala Thr Val Phe Phe 35 40 45
Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu Thr 50 55 60
Val Ser Gly Leu Val Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr Met 65 70 75 80

Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Met Val Glu Phe Tyr Leu Page 122

Arg Gly Val Trp Ile Glu Thr Gly Glu Thr Pro Thr Val Phe Arg Tyr $85 \hspace{1.5cm} 90 \hspace{1.5cm} 95$

100 Ile Leu Ala Ala Cys Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu Leu Ile Gly Ser Leu Val Met Leu Ile Ala Gly Tyr Met Gly Glu Ser 130 135 140 Gly Ser Leu Pro Val Leu Pro Ala Phe Leu Val Gly Cys Ala Ala Trp 145 150 155 160 Leu Tyr Met Ile Tyr Glu Leu Tyr Ala Gly Glu Gly Lys Ala Ala Val 165 170 175 Thr Thr Ala Ser Pro Ala Val Met Ser Ala Tyr Asn Thr Met Met Leu 180 185 190 Ile Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala Gly 195 200 205 Tyr Leu Met Gly Gly Asp Gly Val Tyr Ala Gln Asn Leu Asn Val Ile 210 215 220 Tyr Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Val Ile 225 230 235 240 Trp His Val Ala Val Lys Glu Ser Ser Asn Ala 245 250 DNA Marine eubacteria <400> 148 atgggtaaat tattactgat cttaggcggt gttattgcgc ttccttcgtt tgctgcaagt 60 ggaggcgatc ttgattctag tgatcttact ggagtatctt tttggcttgt tactgctgct 120 ctcttagctg ctactgtttt cttttttgtt gaaagagatc aagtaagcgc taaatggaaa 180 acatcactta cagtttctgg tttagttact ggtattgcat tctggcatta tctctatatg 240 agaggtgtgt ggatcgaaac cggtgaaaca ccaacagtat ttagatatat tgattqgttq 300 ctaactgttc cgttactaat ggttgagttc tacttaatcc tcgcagcttg cactaatgtt 360

420

480

540

gcaggttcat tatttaagaa actactaatt ggttcgcttg taatgcttat tgcaggatat

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600

660

720

754

Ile Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala Gly 195 200 205

Tyr Leu Met Gly Gly Asp Gly Val Tyr Ala Gln Asn Leu Asn Val Ile 210 215 220

Tyr Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Val Ile 225 230 235 240

Trp His Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

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<211> / 34 <212> DNA

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<210> 151

<211> 254

<212> PRT

<213> Marine eubacteria

<400> 151

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Ile Ala Leu Ala Gly Gly His Ser Ser Gly Gly Leu Ala Gly Asp Asp 20 25 30 Page 125

Cys Val Gly Val Thr Phe Trp Ile Ile Ser Met Ala Met Val Ala Ser 35 40 45

Thr Val Phe Phe Ile Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys 50 60

Thr Ser Leu Thr Val Ser Ala Leu Met Thr Leu Ile Ala Ala Val His 65 70 75 80

Tyr Phe Tyr Met Arg Asp Val Trp Val Ala Thr Gly Glu Ser Pro Thr 85 90 95

Val Phe Arg Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Met Ile $100 \hspace{1cm} 105 \hspace{1cm} 110$

Glu Phe Tyr Phe Ile Leu Ala Ala Val Thr Thr Val Ser Ser Gly Ile 115 120 125

Phe Trp Arg Leu Leu Val Gly Thr Val Ile Met Leu Val Gly Gly Tyr 130 140

Leu Gly Glu Ala Gly Met Ile Ser Val Met Thr Gly Phe Ile Ile Gly 145 150 155 160

Met Ile Gly Trp Leu Tyr Ile Leu Tyr Glu Ile Phe Ala Gly Glu Ala 165 170 175

Ser Lys Ala Asn Ala Ser Ser Gly Ser Ala Ala Cys Gln Thr Ala Phe 180 185 190

Gly Ala Leu Arg Leu Ile Val Thr Ile Gly Trp Ala Ile Tyr Pro Leu 195 200 205

Gly Tyr Phe Leu Gly Tyr Leu Gly Gly Gly Ala Asp Pro Ala Thr Leu 210 215 220

Asn Ile Val Tyr Asn Leu Ala Asp Phe Val Asn Lys Ile Ala Phe Gly 225 230 235 240

Leu Ile Ile Trp Ala Ala Ala Val Lys Glu Ser Ser Asn Ala 245 250

<210> 152

<211> 763

<212> DNA

<213> Marine eubacteria

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gcgaaatgga	aaacatcatt	aacagtatca	gcgcttatga	ctttaatcgc	agctgttcac	240
tatttctaca	tgagagatgt	ttgggtagca	actggcgaat	caccaacagt	ctttagatat	300
atagattggt	tgttaacagt	tccacttcta	atgattgagt	tctactttat	cttagcagcg	360
gttacaactg	tatcttcagg	aattttctgg	agattactag	taggtactgt	_, aataatgcta	420
gtaggtggat	acttaggtga	agctggaatg	atttcggtaa	tgacaggttt	cattataggg	480
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gcttctagtg	gaagtgcagc	ttgtcaaaca	gcctttggag	ctttacgttt	aatcgtaacc	600
attggttggg	caatttatcc	gctaggatat	ttcttaggtt	atctaggcgg	tggggcagac	660
ccagctacat	taaacattgt	ttacaactta	gctgactttg	taaacaaaat	tgcttttggt	720
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<210> 153

<211> 254

<212> PRT <213> Marine eubacteria

<400> 153

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Ile Ala Leu Ala Gly Gly His Ser Ser Gly Gly Leu Ala Gly Asp Asp 20 25 30

Tyr Val Gly Val Thr Phe Trp Ile Ile Ser Met Ala Met Val Ala Ser 35 40 45

Thr Val Phe Phe Ile Val Glu Arg Asp Arg Val Ser Ala Lyś Trp Lys 50 60

Thr Ser Leu Thr Val Ser Ala Leu Val Thr Leu Ile Ala Ala Val His 65 70 75 80

Tyr Phe Tyr Met Arg Asp Val Trp Val Ala Thr Gly Glu Ser Pro Thr $85 \hspace{1.5cm} 90 \hspace{1.5cm} 95$

Val Phe Arg Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Met Ile $100 \hspace{1cm} 105 \hspace{1cm} 110$

02716.0005.NPUS01.ST25.txt Glu Phe Tyr Phe Ile Leu Ala Ala Val Thr Thr Val Ser Ser Gly Ile Phe Trp Arg Leu Leu Val Gly Thr Val Ile Met Leu Val Gly Gly Tyr 130 140 Leu Gly Glu Ala Gly Met Ile Ser Val Met Thr Gly Phe Ile Ile Gly Met Ile Gly Trp Leu Tyr Ile Leu Tyr Glu Ile Phe Ala Gly Glu Ala Ser Lys Ala Asn Ala Ser Ser Gly Ser Ala Ala Cys Gln Thr Ala Phe 180 185 190 Gly Ala Leu Arg Leu Ile Val Thr Ile Gly Trp Ala Ile Tyr Pro Leu Gly Tyr Phe Leu Gly Tyr Leu Gly Gly Gly Ala Asp Pro Ala Thr Leu 210 225 220 Asn Ile Val Tyr Asn Leu Ala Asp Phe Val Asn Lys Ile Ala Phe Gly 225 230 235 Leu Ile Ile Trp Ala Ala Ala Val Lys Glu Ser Ser Asn Alá 245 250 <210> 154 <211> 763 DNA Marine eubacteria

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ccagctacat taaacattgt ttacaactta gctgactttg taaacaaaat tgcttttggt

720

763

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Leu	Ala	Leu	Ala 20	Gly	Gly	His	Ser	Ser 25	Gly	Leu ,	Ala	Gly	Asp 30	Asp	Tyr
val	Gly	va1 35.	Thr	Phe	Trp	Ile	Ile 40	Ser	Met	Ala	Met	Val 45	Ala	Ser	Thr
Val	Phe 50	Phe	Ile	٧al	Glu	Arg 55	Asp	Arg	val	ser	ser 60	Lys	Trp	Lys	Thr
Ser 65	Leu	Thr	٧a٦	Ser	Ala 70	Leu	val	Thr	Leu	11e 75.	Ala	Ala	٧a٦	His	Tyr 80
Phe	Tyr	Met	Arg	Asp 85	٧al	Тгр	val	Ala	Thr 90	Gly	Glu	Ser	Pro	Thr 95	val
Phe	Arg	Tyr	Ile 100	Asp	тгр	Leu	Leu	Thr 105	val	Pro	Leu	Leu	Met 110	Ile	Glu
Phe	Tyr	Phe 115	Ile	Leu	Ala	Ala	va1 120	Thr	Thr	val	Ser	Ser 125	Gly	Ile	Phe
Тгр	Arg 130	Leu	Leu	Ile	Gly	Thr 135	val	Val	Met	Leu	Val 140	Gly	Gly	Tyr	Met
Gly 145	Glu	Ąlа	Gly	Met	Ile 150	Ser	۷al	Met	Thr	Gly 155	Phe	Ile	Ile	Gly	Met 160
Ile	Gly	Trp	Leu	Туг 165	Ile	Leu	Tyr	Glu	Ile 170	Phe	Ala	Gly	Glu	Ala 175	Ser
Lys	Ala	Asn	Ala 180	Ser	Ser	Gly	Ser	Ala 185	Ala	Cys	Gln	Thr	Ala 190	Phe	Gly
Ala	Leu	Arg 195	Leu	Ile	Val	Thr	Val 200	_	Trp age		Ile	Tyr 205	Pro	Ile	Gly

Tyr Phe Val Gly Tyr Leu Thr Gly Gly Gly Ala Asp Ala Ala Thr Leu 210 215 220

Asn Ile Val Tyr Asn Leu Ala Asp Phe Val Asn Lys Ile Ala Phe Gly 235 230 240

Leu Ile Ile Trp Ala Ala Ala Val Lys Glu Ser Ser Asn Ala 245 250

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<212> DNA

<213> Marine eubacteria

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tccatggcta	tggttgcgtc	aacagtattt	ttcattgtgg	agcgtgacag	agttagctca	180
aaatggaaaa	catcattaac	agtatcagct	ttggttacat	taattgctgc	agtgcattat	240
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gcagctacac	taaacatagt	ttacaactta	gctgattttg	taaacaaaat	tgcctttggt	720
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254 <211>

<212> PRT

<213> Marine eubacteria

<400> 157

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Leu Ala Leu Ala Gly Gly His Ser Ser Gly Leu Ala Gly Asp Asp Tyr 20 25 30

Val Gly Val Thr Phe Trp Ile Ile Ser Met Ala Met Val Ala Ser Thr Page 130

Val Phe Phe Ile Val Glu Arg Asp Arg Val Ser Ser Lys Trp Lys Thr 50 60

Ser Leu Thr Val Ser Ala Leu Val Thr Leu Ile Ala Ala Val His Tyr 65 70 75 80

Phe Tyr Met Arg Asp Val Trp Val Ala Thr Gly Glu Ser Pro Thr Val 85 90 95

Phe Arg Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Leu Met Ile Glu 100 105 110

Phe Tyr Phe Ile Leu Ala Ala Val Thr Thr Val Ser Ser Gly Ile Phe 115 120 125

Trp Arg Leu Leu Ile Gly Thr Val Val Met Leu Val Gly Gly Tyr Met 130 135 140

Gly Glu Ala Gly Met Ile Ser Val Met Thr Gly Phe Ile Ile Gly Met 145 150 155 160

Ile Gly Trp Leu Tyr Ile Leu Tyr Glu Ile Phe Ala Gly Glu Ala Ser 165 170 175

Lys Ala Asn Ala Ser Ser Gly Ser Ala Ala Cys Gln Thr Ala Phe Gly
180 185 190

Ala Leu Arg Leu Ile Val Thr Val Gly Trp Ala Ile Tyr Pro Ile Gly 195 200 205

Tyr Phe Val Gly Tyr Leu Thr Gly Gly Gly Ala Asp Ala Ala Thr Leu 210 215 220

Asn Ile Val Tyr Asn Leu Ala Asp Phe Val Asn Lys Ile Ala Phe Gly 235 230 235

Leu Ile Ile Trp Ala Ala Ala Val Lys Glu Ser Ser Asn Ala 245 250

<210> 158

<211> 763

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aaatggaaaa	catcattaac	agtatcagct	ttggttacat	taattgctgc	agtgcattat	240
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atcggttggc	tatatattct	ttacgaaatc	tttgctggtg	aagctagtaa	agcaaacgct	540
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gcagctacac	taaacatagt	ttacaactta	gctgattttg	taaacaaaat	tgcctttggt	720
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<210> 159

<211> 250

<212> PRT

<213> Marine eubacteria

<400> 159

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Ala Ala Ala Gly Gly Asp Leu Asp Ile Ser Asp Thr Val Gly Val Ser 20 25 30

Phe Trp Leu Val Thr Ala Gly Met Leu Ala Ala Thr Val Phe Phe 35 40 45

Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu Thr Val 50 60

Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr Met Arg 70 75 80

Gly Val Trp Ile Asp Thr Gly Asp Thr Pro Thr Val Phe Arg Tyr Ile 85 90 95

Asp Trp Leu Leu Thr Val Pro Leu Gln Met Val Glu Phe Tyr Leu Ile 100 105 110

Leu Ala Ala Cys Thr Ser Val Ala Ala Ser Leu Phe Lys Lys Leu Leu 115 120 125

Ala Gly Ser Leu Val Met Leu Gly Ala Gly Phe Ala Gly Glu Ala Gly 130 140

Leu Ala Pro Val Leu Pro Ala Phe Ile Ile Gly Met Ala Gly Trp Leu 145 150 155 160

Tyr Met Ile Tyr Glu Leu Tyr Met Gly Glu Gly Lys Ala Ala Val Ser 165 170 175

Thr Ala Ser Pro Ala Val Asn Ser Ala Tyr Asn Ala Met Met Met Ile 180 185 190

Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala Gly Tyr 195 200 205

Leu Met Gly Gly Glu Gly Val Tyr Ala Ser Asn Leu Asn Leu Ile Tyr 210 215 220

Asn Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile Trp 225 230 235 240

Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

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<213> Marine eubacteria

<400> 160

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aatgttgcag ttaaagaatc tagtaatgct

<210> 161

<211> 230 <212> PRT

<213> Marine eubacteria

<400> 161

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Trp Leu Ile Ser Met Ala Met Val Ala Ala Thr Ala Phe Phe Leu 20 25 30

Glu Arg Asp Arg Val Ala Ala Lys Trp Lys Thr Ser Leu Thr Val Ala 35 40 45

Gly Leu Val Thr Gly Ile Ala Ala Trp His Tyr Phe Tyr Met Arg Gly 50 60

Val Trp Val Ala Thr Gly Asp Ser Pro Thr Val Leu Arg Tyr Ile Asp 65 70 75 80

Trp Leu Ile Thr Val Pro Leu Gln Ile Val Glu Phe Tyr Val Ile Leu 85 90 95

Ala Ala Met Thr Ala Val Ala Ser Ser Leu Phe Trp Arg Leu Leu Ile 100 105 110

Ala Ser Ile Ile Met Leu Val Phe Gly Tyr Met Gly Glu Thr Gly Ala 115 120 125

Met Asn Val Thr Leu Ala Phe Val Ile Gly Met Ala Gly Trp Leu Tyr 130 135 140

Ile Ile Tyr Glu Val Phe Ala Gly Glu Ala Ser Lys Ala Ser Ala Gly 145 150 155 160

Ser Gly Asn Ala Ala Gly Gln Thr Ala Phe Asn Ala Leu Arg Leu Ile 165 170 175

Val Thr Val Gly Trp Ala Ile Tyr Pro Ile Gly Tyr Ala Val Gly Tyr 180 185 190

Phe Gly Gly Val Asp Ala Gly Ser Leu Asn Leu Ile Tyr Asn Leu 195 200 205

Ala Asp Phe Val Asn Lys Ile Ala Phe Gly Met Ala Ile Tyr Val Ala Page 134 Ala Val Ser Asp Ser Asn 225 230

<210> 162 <211> 690

<212> DNA

<213> Marine eubacteria

<400> 162

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<210> 163 <211> 249

<212> PRT

<213> Marine eubacteria

<400> 163

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Ala Ala Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val Ser 20 25 30

Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr Val 50 60

Ser Gly Leu Val Thr Gly Ile Ala Phe Trp Lys Tyr Met Tyr Met Arg
65 70 75 80
Page 135

Gly	Val	Trp	Ile	Glu 85	Thr	Gly	Asp	Ser	Pro 90	Thr	Val	Phe	Arg	Tyr 95	Ile	
Asp	Trp	Leu	Leu 100	Thr	val	Pro	Leu	Leu 105	Ile	Cys	Glu	Phe	Туг 110	Leu	Ile	
Leu	Ala	Ala 115	Ala	Thr	Asn	val	Ala 120	Gly	Ser	Leu	Phe	Lys 125	Lys ,	Leu	Leu	
val	Gly 130	Ser	Leu	val	Met	Leu 135	٧a٦	Phe	Gly	Tyr	Met 140	Gly	Glu	Ala	Gly	
Ile 145	Met	Ala	Ala	Trp	Pro 150	Ala	Phe	Ile	Ile	Gly 155	Cys	Leu	Ala	Trp	Val 160	
Туг	Met	Ile	Tyr	Glu 165	Leu	Тгр	Ala	Gly	Glu 170	Gly	Lys	Ser	Alą	Cys 175	Asn	
Thr	Ala	Ser	Pro 180	Ala	val	Gln	Ser	Ala 185	Tyr	Asn	Thr	Met	Met 190	Tyr	Ile	
Ile	Ile	Phe 195	Gly	Trp	Ala	Ile	Tyr 200	Pro	٧a٦	Gly	Tyr	Phe 205	Thr	Gly	Tyr	
Leu	Met 210	Gly	Asp	Gly	Gly	Ser 215	Ala	Leu	Asn	Leu	Asn 220	Leu	Ilé	Tyr	Asn	
Leu 225	Ala	Asp	Phe	val	Asn 230	Lys	Ile	Leu	Phe	G]y 235	Leu	Ile	Ile	Trp	Asn 240	
Val	Ala	∨al	Lys	G1u 245	Ser	Ser	Asn	Ala								
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tcat	taac	tg t	atct	ggto	ct to	gttac	tggt	att	gctt	tct	ggaa	atao	at o	gtaca	atgaga	240
gggg	tato	ga t	tgaa	acto	gg tg	gatto	gcca	a act	gtat	tta	gata	catt	ga t	tggt	tacta	300
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ggtgaagcag	gaatcatggc	tgcatggcct	gcattcatta	ttgggtgttt	agcttgggta	480
tacatgattt	atgaattatg	ggctggagaa	ggaaaatctg	catgtaatac	tgcaagtcct	540
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cctgtaggtt	atttcacagg	ttacctgatg	ggtgacggtg	gatcagctct	taacttaaac	660
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<211> 249

<212> PRT

<213> Marine eubacteria

<400> 165

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Ala Ala Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val Ser 20 25 30

Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr Val 50 60

Ser Gly Leu Val Thr Gly Ile Ala Phe Trp Asn Tyr Met Tyr Met Arg
65 70 75 80

Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg Tyr Ile 85 90 95

Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr Leu Ile $100 \hspace{1cm} 105 \hspace{1cm} 110$

Leu Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu Leu 115 120 125

Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glu Ala Gly 130 135 140

Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp Val 145 150 155 160 02716.0005.NPUS01.ST25.txt Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys Asn 165 170 175

Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr Ile 180 185 190

Ile Ile Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr Gly Tyr 195 200 205

Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr Asn 210 220

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Val Ala Val Lys Glu Ser Ser Asn Ala 245

<210> 166

<211> 750

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<210> 167

<211> 249

<212> PRT

<213> Marine eubacteria

<400> 167

Met Lys Leu Leu Ile Leu Gly Ser Val Ile Ala Leu Pro Thr Phe $1 \hspace{1cm} 5 \hspace{1cm} 10 \hspace{1cm} 15$

Ala Ala Gly Gly Asp Leu Asp Ala Ser Asp Tyr Thr Gly Val Ser 20 25 30

Phe Trp Leu Val Thr Ala Ala Leu Leu Ala Ser Thr Val Phe Phe 35 40 45

Val Glu Arg Asp Arg Val Ser Ala Lys Trp Lys Thr Ser Leu Thr Val 50 60

Ser Gly Leu Val Thr Gly Ile Ala Phe Trp Gln Tyr Met Tyr Met Arg 70 75 80

Gly Val Trp Ile Glu Thr Gly Asp Ser Pro Thr Val Phe Arg Tyr Ile 85 90 95

Asp Trp Leu Leu Thr Val Pro Leu Leu Ile Cys Glu Phe Tyr Leu Ile 100 105 110

Leu Ala Ala Thr Asn Val Ala Gly Ser Leu Phe Lys Lys Leu Leu 115 120 125

Val Gly Ser Leu Val Met Leu Val Phe Gly Tyr Met Gly Glú Ala Gly 130 135 140

Ile Met Ala Ala Trp Pro Ala Phe Ile Ile Gly Cys Leu Ala Trp Val 145 150 155 160

Tyr Met Ile Tyr Glu Leu Trp Ala Gly Glu Gly Lys Ser Ala Cys Asn 165 170 175

Thr Ala Ser Pro Ala Val Gln Ser Ala Tyr Asn Thr Met Met Tyr Ile 180 185 190

Ile Ile Phe Gly Trp Ala Ile Tyr Pro Val Gly Tyr Phe Thr Gly Tyr 195 200 205

Leu Met Gly Asp Gly Gly Ser Ala Leu Asn Leu Asn Leu Ile Tyr Asn 210 220

Leu Ala Asp Phe Val Asn Lys Ile Leu Phe Gly Leu Ile Ile Trp Asn 225 230 235 240

Val Ala Val Lys Glu Ser Ser Asn Ala 245

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tcattaactg tatctggtct tgttactggt attgctttct ggcagtacat gtacatgaga	240
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acagttcctc tattaatatg tgaattctac ttaattcttg ctgctgcaac taatgttgct	360
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Val Ser Phe Trp Leu Val Thr Ala Gly Met Leu Ala Ala Thr Val Phe 35 40 45	
Phe Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60	

Met Arg Gly Val Trp Ile Asp Thr Gly Asp Thr Pro Thr Val Phe Arg Page 140

Ala Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp Lys Tyr Leu Tyr 65 70 75 80

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Met Val Glu Phe Tyr 100

Leu Ile Leu Ala Ala Cys Thr Ser Val Ala Ala Ser Leu Phe Lys Lys 115 120 125

Leu Leu Ala Gly Ser Leu Val Met Leu Gly Ala Gly Phe Ala Gly Glu 130 135 140

Ala Gly Leu Ala Pro Val Leu Pro Ala Phe Ile Ile Gly Met Ala Gly 145 150 155 160

Trp Leu Tyr Met Ile Tyr Glu Leu Tyr Met Gly Glu Gly Lys Ala Ala 165 170 175

Val Ser Thr Ala Ser Pro Ala Val Asn Ser Ala Tyr Asn Ala Met Met

Met Ile Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala 195 200 205

Gly Tyr Leu Met Gly Gly Glu Gly Val Tyr Ala Ser Asn Leu Asn Leu 210 215 220

Ile Tyr Asn Leu Ala Asp Leu Val Asn Lys Ile Leu Phe Gly Leu Ile 225 230 235 240

Ile Trp Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

170 756 <210>

<212> DNA <213> Marine eubacteria

<400> 170

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t	ttgcaggcg	aagctggatt	agctcctgta	ttacctgctt	tcattattgg	tatggctgga	480
t	ggttataca	tgatttatga	gctatatatg	ggtgaaggta	aggctgctgt	aagtactgca	540
a	gtcctgctg	ttaactctgc	atacaacgca	atgatgatga	ttattgttgt	tggatgggca	600
a	tttatcctg	ctggatatgc	tgctggttac	ctaatgggtg	gcgaaggtgt	atacgcttca	660
a	acttaaacc	ttatatataa	ccttgccgac	cttgttaaca	agattctatt	tggtttgatc	720
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171 252 <210>

<211>

PRT

Marine eubacteria

<400> 171

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Ser Phe Ala Ala Gly Gly Asp Leu Asp Ile Ser Asp Thr Val Gly 20 25 30

Val Ser Phe Trp Leu Val Thr Ala Gly Met Leu Ala Ala Thr Val Phe 35 40 45

Phe Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60

Ala Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp Asn Tyr Leu Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Asp Thr Gly Asp Thr Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Met Val Glu Phe Tyr

Leu Ile Leu Ala Ala Cys Thr Ser Val Ala Ala Ser Leu Phe Lys Lys 115 120 125

Leu Leu Ala Gly Ser Leu Val Met Leu Gly Ala Gly Phe Ala Gly Glu 130 135 140

Ala Gly Leu Ala Pro Val Leu Pro Ala Phe Ile Ile Gly Met Ala Gly

Trp Leu Tyr Met Ile Tyr Glu Leu Tyr Met Gly Glu Gly Lys Ala Ala 165 170 175

Val Ser Thr Ala Ser Pro Ala Val Asn Ser Ala Tyr Asn Ala Met Met 180 185 190

Met Ile Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala 195 200 205

Gly Tyr Leu Met Gly Gly Glu Gly Val Tyr Ala Ser Asn Leu Asn Leu 210 215 220

Ile Tyr Asn Leu Ala Asp Leu Val Asn Lys Ile Leu Phe Gly Leu Ile 225 230 235 240

Ile Trp Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

<210> 172

<211> 756

<212> DNA

<213> Marine eubacteria

<400> 172

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Thr Met Gly Lys Leu Leu Leu Ile Leu Gly Ser Ala Ile Ala Leu Pro
1 5 10 15
Page 143

<210> 173

<211> 252

<212> PRT

<213> Marine eubacteria

<400> 173

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Val Ser Phe Trp Leu Val Thr Ala Gly Met Leu Ala Ala Thr Val Phe 35 40 45

Phe Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60

Ala Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp Gln Tyr Leu Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Asp Thr Gly Asp Thr Pro Thr Val Phe Arg 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Met Val Glu Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Cys Thr Ser Val Ala Ala Ser Leu Phe Lys Lys 115 120 125

Leu Leu Ala Gly Ser Leu Val Met Leu Gly Ala Gly Phe Ala Gly Glu 130 135 140

Ala Gly Leu Ala Pro Val Leu Pro Ala Phe Ile Ile Gly Met Ala Gly 145 150 155 160

Trp Leu Tyr Met Ile Tyr Glu Leu Tyr Met Gly Glu Gly Lys Ala Ala 165 170 175

Val Ser Thr Ala Ser Pro Ala Val Asn Ser Ala Tyr Asn Ala Met Met 180 185 190

Met Ile Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala 195 200 205

Gly Tyr Leu Met Gly Gly Glu Gly Val Tyr Ala Ser Asn Leu Asn Leu 210 215 220

Ile Tyr Asn Leu Ala Asp Leu Val Asn Lys Ile Leu Phe Gly Leu Ile 225 230 235 240

Ile Trp Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

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ggtatgt	tag	cggca	actg	t gt	tctt	tttt	gta	ıgaaa	agag	acca	agto	cag '	cgcta	agtgg
aaaactt	cac	ttgct	gtat	c to	gtti	taatt	act	ggta	atag	ctti	ttg	gca	gtato	tctat
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gttgctg	ctt	catta	ittta	a ga	agct	ttcta	gct	ggtt	cat	tagt	aato	gtt	aggtg	gctgga
tttgcag	gcg	aagct	ggat	t ag	gctco	tgta	tta	cctg	ctt	tcat	tatı	tgg	tatgg	gctgga
tggttat	aca	tgatt	tatg	a go	tata	atatg	ggt	gaag	ggta	agge	tgct	tgt	aagta	actgca
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atttato	ctg	ctgga	atatg	c to	gctg	gttac	cta	atgg	gtg	gcga	aggt	tgt	ataco	gcttca
aacttaa	acc	ttata	itata	a co	ttg	cgac	ctt	gtta	aaca	agat	tcta	att	tggtt	tgato
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Ser Phe	Ala	Ala 20	Ala	Gly	Gly	Asp	Leu 25	Asp	Ile	Ser	Asp	Thr 30	Val	Gly
Val Ser	Phe 35	Тгр	Leu	val	Thr	Ala 40	Glу	Met	Leu	Ala	Ala 45	Thr	val	Phe
Phe Phe	val	Glu	Arg	Asp	G]n 55	val	Ser	Ala	Lys	Trp 60	Lys	Thr	Ser	Leu
Ala Val 65	Ser	Gly	Leu	Ile 70	Thr	Gly	Ile	Ala	Phe 75	Trp	Glu	Tyr	Leu	Tyr 80

Met Arg Gly Val Trp Ile Asp Thr Gly Asp Thr Pro Thr Val Phe Arg 85 90 95

02716.0005.NPUS01.ST25.txt Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Met Val Glu Phe Tyr 100 105 110
Leu Ile Leu Ala Ala Cys Thr Ser Val Ala Ala Ser Leu Phe Lys Lys 115 120 125
Leu Leu Ala Gly Ser Leu Val Met Leu Gly Ala Gly Phe Ala Gly Glu 130 135 140
Ala Gly Leu Ala Pro Val Leu Pro Ala Phe Ile Ile Gly Met Ala Gly 145 150 155 160
Trp Leu Tyr Met Ile Tyr Glu Leu Tyr Met Gly Glu Gly Lys Ala Ala 165 170 175
Val Ser Thr Ala Ser Pro Ala Val Asn Ser Ala Tyr Asn Ala Met Met 180 185 190
Met Ile Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala 195 200 205
Gly Tyr Leu Met Gly Glu Gly Val Tyr Ala Ser Asn Leu Asn Leu 210 215 220
Ile Tyr Asn Leu Ala Asp Leu Val Asn Lys Ile Leu Phe Gly Leu Ile 225 230 235 240
Ile Trp Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250
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tttgcaggcg aagctggatt agctcctgta ttacctgctt tcattattgg tatggctgga 480
tggttataca tgatttatga gctatatatg ggtgaaggta aggctgctgt aagtactgca 540 Page 146

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atttggaatg ttgctgttaa agaatcttct aatgct									
<210> 177 <211> 252 <212> PRT <213> Marine eubacteria									
<400> 177									
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Ser Phe Ala Ala Ala Gly Gly Asp Leu Asp Ile Ser Asp Thr Val Gly 20 25 30									
Val Ser Phe Trp Leu Val Thr Ala Gly Met Leu Ala Ala Thr Val Phe 35 40 45									
Phe Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu 50 55 60									
Ala Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp Trp Tyr Leu Tyr 65 75 80									
Met Arg Gly Val Trp Ile Asp Thr Gly Asp Thr Pro Thr Val Phe Arg 85 90 95									
Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Met Val Glu Phe Tyr 100 105 110									
Leu Ile Leu Ala Ala Cys Thr Ser Val Ala Ala Ser Leu Phe Lys Lys 115 120 125									
Leu Leu Ala Gly Ser Leu Val Met Leu Gly Ala Gly Phe Ala Gly Glu 130 135 140									
Ala Gly Leu Ala Pro Val Leu Pro Ala Phe Ile Ile Gly Met Ala Gly 145 150 150 155									
Trp Leu Tyr Met Ile Tyr Glu Leu Tyr Met Gly Glu Gly Lys Ala Ala 165 170 175									
Val Ser Thr Ala Ser Pro Ala Val Asn Ser Ala Tyr Asn Ala Met Met 180 185 190 Page 147									

Met Ile Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala 195 200 205

Gly Tyr Leu Met Gly Gly Glu Gly Val Tyr Ala Ser Asn Leu Asn Leu 210 215 220

Ile Tyr Asn Leu Ala Asp Leu Val Asn Lys Ile Leu Phe Gly Leu Ile 225 230 235 240

Ile Trp Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

<210> 178

<211> 756

<212> DNA

<213> Marine eubacteria

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<210> 179

<211> 252

-212 EDT

<213> Marine eubacteria

<400> 179

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Ser Phe Ala Ala Ala Gly Gly Asp Leu Asp Ile Ser Asp Thr Val Gly Page 148 Val Ser Phe Trp Leu Val Thr Ala Gly Met Leu Ala Ala Thr Val Phe 35 40 . 45

Phe Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60

Ala Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Asp Thr Gly Asp Thr Pro Thr Val Phe Ala 85 90 95

Tyr Ile Asp Trp Leu Leu Thr Val Pro Leu Gln Met Val Glu Phe Tyr 100 105 110

Leu Ile Leu Ala Ala Cys Thr Ser Val Ala Ala Ser Leu Phe Lys Lys 115 120 125

Leu Leu Ala Gly Ser Leu Val Met Leu Gly Ala Gly Phe Ala Gly Glu 130 135 140

Ala Gly Leu Ala Pro Val Leu Pro Ala Phe Ile Ile Gly Met Ala Gly 145 150 155 160

Trp Leu Tyr Met Ile Tyr Glu Leu Tyr Met Gly Glu Gly Lys Ala Ala 165 170 175

Val Ser Thr Ala Ser Pro Ala Val Asn Ser Ala Tyr Asn Ala Met Met 180 185 190

Met Ile Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala 195 200 205

Gly Tyr Leu Met Gly Gly Glu Gly Val Tyr Ala Ser Asn Leu Asn Leu 210 220

Ile Tyr Asn Leu Ala Asp Leu Val Asn Lys Ile Leu Phe Gly Leu Ile 225 230 235 240

Ile Trp Asn Val Ala Val Lys Glu Ser Ser Asn Ala 245 250

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<210> 181

<211> 252

<212> PRT

<213> Marine eubacteria

<400> 181

Thr Met Gly Lys Leu Leu Leu Ile Leu Gly Ser Ala Ile Ala Leu Pro $1 \hspace{1cm} 5 \hspace{1cm} 10 \hspace{1cm} 15$

Ser Phe Ala Ala Gly Gly Asp Leu Asp Ile Ser Asp Thr Val Gly 20 25 30

Val Ser Phe Trp Leu Val Thr Ala Gly Met Leu Ala Ala Thr Val Phe 35 40 45

Phe Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu 50 55 60

Ala Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr 65 70 75 80

Met Arg Gly Val Trp Ile Asp Thr Gly Asp Thr Pro Thr Val Phe Glu 85 90 95

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Phe Phe Val Glu Arg Asp Gln Val Ser Ala Lys Trp Lys Thr Ser Leu 50 60 .

Ala Val Ser Gly Leu Ile Thr Gly Ile Ala Phe Trp His Tyr Leu Tyr 65 70 75 80

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Trp Leu Tyr Met Ile Tyr Glu Leu Tyr Met Gly Glu Gly Lys Ala Ala 165 170 175

Val Ser Thr Ala Ser Pro Ala Val Asn Ser Ala Tyr Asn Ala Met Met 180 185 190

Met Ile Ile Val Val Gly Trp Ala Ile Tyr Pro Ala Gly Tyr Ala Ala Page 152 Gly Tyr Leu Met Gly Gly Glu Gly Val Tyr Ala Ser Asn Leu Asn Leu 210 215 220

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